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ART. XXX.—REMARKS ON THE BRITISH AND UNITED  
STATES PHARMACOPŒIAS.

THE latest editions of these Pharmacopœias are the Dublin Pharmacopœia of 1826, the London, of 1836, the Edinburgh, of 1841, and the United States, of 1842. The Edinburgh Pharmacopœia of 1841 is the second edition, with corrections, of the recently revised work; the first edition having appeared in 1839. The revised work presents one striking and judicious change, namely, its publication in the English language; the Latin being retained only for the official names. The United States Pharmacopœia was first published in 1820, and the edition of 1842 is the result of the second decennial revision. As originally printed, it was in Latin, with an English translation on the opposite page. But upon the recent revision, it was deemed advisable to follow the example of the Edinburgh College, and print every part in the English language, except the official names.

Having originally derived the greater part of our Pharmacy from the British Islands, we are necessarily much interested in the progress of Pharmacology in the British Dominions. Our first Pharmacopœia was chiefly made up of selections of formulæ from the British Pharmacopœias, and our successive revisions have been much aided by a careful study

of the progressive improvements made in these works. So, also, there is reason to believe that aid has been afforded to our British brethren in return. Thus it is that the Pharmacy of the two countries is so linked together, that we, on this side of the water, feel the importance of studying the changes made in the Pharmacopœias of the British Empire.

From the length of time that has elapsed since the last revision of the Dublin Pharmacopœia, now sixteen years, it is to be hoped that a revised edition of that work will shortly appear, in which advantage will be taken of the great improvements which have been made in the interim, and every reasonable concession in nomenclature be made in favor of the important principle of uniformity of officinal names. As yet the three British Colleges have not been able to agree upon one Pharmacopœia for the British Empire, a result which, if ever accomplished, will not only be an important benefit to the British nation, but an influential step in the progress of Pharmacy, wherever the English language is spoken. The present Edinburgh Pharmacopœia is the result of a revision after an interval of twenty-two years, and the present London work, after the lapse of twelve years.

The subject of nomenclature, though secondary to the paramount object of the proper preparation of medicines, is confessedly very important. A number of synonymes creates confusion, obstructs the advancement of the medical and pharmaceutical student, and leads to serious mistakes. Admitting these positions, it is highly gratifying to observe that the discrepancies in nomenclature are becoming less and less with every revision of the British Pharmacopœias.

One great step in the simplification of nomenclature was made in 1820, in the first U. S. Pharmacopœia. In the preface to that work it is stated, that "a single word is always used for the officinal name of the medicine, wherever such a word is expressive, and without ambiguity. For example, the name *Jalapa* is used instead of *Convolvulus Jalapa*, of the Edinburgh Pharmacopœia, and *Jalapæ Radix*, of the London; *Colocynthis*, instead of *Cucumis Colocynthis*, and *Colocynthis Pulpa*, &c. The advantages of this mode are,

that the name stands in the nominative case; that it expresses the medicine, and nothing else; that it is short and explicit, and does not require to be mutilated in practical use, as long names will inevitably be." The principle of nomenclature, here laid down, was happily applied in a great number of cases, and has since been successively adopted in the London and Edinburgh Pharmacopœias. The extent of this reform in nomenclature, and the influence its adoption has had in diminishing synonymes, are shown by the following table.

<i>Pharm. Edinburgh, 1817.</i>	<i>Pharm. London, 1824.</i>	<i>Pharm. U.S. 1820. L. 1836 &amp; E. 1841.</i>
Allii Sativi Radix.	Allii Radix.	Allium.
Aloes Extractum.	Aloes spicata Extractum.	Aloe.*
Pimpinellæ Anisi Semina.	Anisi Semina.	Anisum.
Anthemidis Nobilis Flores.	Anthemidis Flores.	Anthemis.
Cochleariæ Armoraciæ Radix.	Armoraciæ Radix.	Armoracia.
Ferulæ Assafoetidæ Gummi-resina.	Assafoetidæ Gummi-resina.	Assafoetida.
Atropæ Belladonnæ Folia.	Belladonnæ Folia.	Belladonna.
Canellæ Albæ Cortex.	Canellæ Cortex.	Canella.
Capsici Annui Fructus.	Capsici Baccæ.	Capsicum.
Amomi Repentis Semina.	Cardamomi Semina.	Cardamomum.
Crotonis Eleutheriæ Cortex.	Cascarillæ Cortex.	Cascarilla.
Acaciæ Catechu Extractum.	Catechu Extractum.	Catechu.
Lauri Cinnamomi Cortex.	Cinnamomi Cortex.	Cinnamomum.
Cucumeris Colocynthis Pulpa.	Colocynthis Pulpa.	Colocynthis.
Coriandri Sativi Semina.	Coriandri Semina.	Coriandrum.
Croci Sativi Stigmata.	Croci Stigmata.	Crocus.
Solani Dulcamaræ Caules.	Dulcamaræ Caulis.	Dulcamara.
Anethi Fœniculi Semina.	Fœniculi Semina.	Fœniculum.
Bubonis Galbani Gummi-Resina.	Galbani Gummi-resina.	Galbanum.
Gentianæ Lutæ Radix.	Gentianæ Radix.	Gentiana.
Hæmatoxyli Campechiani Lignum.	Hæmatoxyli Lignum.	{ Hæmatoxylon, U.S., E. { Hæmatoxylum, L.
Hordei Distichi Semina.	Hordei Semina.	Hordeum.
Ipecacuanhæ Radix.	Ipecacuanhæ Radix.	Ipecacuanha.
Convolvuli Jalapæ Radix.	Jalapæ Radix.	Jalapa.
Lavandulæ Spiciæ Flores.	Lavandulæ Flores.	Lavandula.
Myristicæ Mosehatæ Nucleus.	Myristicæ Nuclei.	Myristica.
Myrti Pimentæ Fructus.	Pimentæ Baccæ.	Pimenta.
Quassie Excelsæ Lignum.	Quassie Lignum.	Quassia.
Rhei Radix.	Rhei Radix.	Rheum.
Rorismarini Officinalis Cacumina.	Rorismarini Cacumina.	Rosmarinus.

\* In the Ed. Pharmacopœia, in three subdivisions, *Aloe Barbadosensis*, *Indica*, and *Socotorina*.

<i>Pharm. Edinburgh, 1817.</i>	<i>Pharm. London, 1824.</i>	<i>Pharm. U.S. 1820, L. 1836 &amp; E. 1841.</i>
Juniperi Sabinae Folia.	Sabinae Folia.	Sabina.
Convolvuli Scammoniae Gummi- Resina.	Scammoniae Gummi- resina.	} Scammonium.
Scilla Maritimae Radix.	Scilla Radix.	
Polygalae Senegae Radix.	Senegae Radix.	Senega.
Cassiae Sennae Folia.	Sennae Folia.	Senna.*
Aristolochiae Serpentariae Radix.	Serpentariae Radix.	Serpentaria.
Sinapis Albae Semina.	Sinapis Semina.	} Sinapis, U.S., L. Sinapi, E.
Spigeliae Marilandicae Radix.	Spigeliae Radix.	
Nicotiani Tabaci Folia.	Tabaci Folia.	Spigelia.
Tamarindi Indicae Fructus.	Tamarindi Pulpa.	Tabacum.
Tormentillae Erectae Radix.	Tormentillae Radix.	Tamarindus.
Rhois Toxicodendri Folia.	Toxicodendri Folia.	Tormentilla.
Arbuti Uvae Ursi Folia.	Uvae Ursi Folia.	Toxicodendron.†
Valerianae Officinalis Radix.	Valerianae Radix.	Uva ursi.
Amomi Zingiberis Radix.	Zingiberis Radix.	Valeriana.
		Zingiber.

By the foregoing list it appears that in a number of cases the Edinburgh and London Pharmacopœias have adopted the nomenclature of the U. S. Pharmacopœia of 1820. In the case of the London Pharmacopœia this was not done in 1824, the year in which the first revision of that work took place after the reform introduced by our first Pharmacopœia, but was postponed until the revision of 1836. This is distinctly shown by the table.

In the following names the U. S. Pharmacopœia of 1830 has been followed.

<i>Pharm. Edinburgh, 1817.</i>	<i>Pharm. London, 1824.</i>	<i>Pharm. U.S. 1830, L. 1836 &amp; E. 1841.</i>
Eugeniae Caryophyllatae Flores.	Caryophylli.	Caryophyllus.
	Krameriae Radix.	Krameria.
Daphnes Mezerei Cortex.	Mezerei Cortex.	} Mezereum, U.S., L.† Mezereon, E.
Rosae Centifoliae Petala.	Rosae centifoliae Petala.	
Rosae Gallicae Petala.	Rosae Gallicae Petala.	Rosa Centifolia.
Quassiae Simarubae Cortex.	Simarubae Cortex.	Rosa Gallica.
Styracis Officinalis Balsamum.	Styracis Balsamum.	Simaruba.‡
Leontodi Taraxaci Radix.	Taraxaci Radix.	Styrax.
		Taraxacum.

\* In the Ed. Pharmacopœia, in two subdivisions,—*Senna Alexandrina* and *Indica*.

† Except the Ed. Pharmacopœia, from which this medicine is now dismissed.

‡ Mezereum in the U. S. Pharmacopœia of 1820.

§ Simarouba in the U. S. Pharmacopœia of 1820.

In the instances, given in these tables, not only the principle of nomenclature, but the exact name of the U. S. Pharmacopœia has been adopted. In many other cases, the principle has been adopted, but the medicine is either not included in the U. S. Pharmacopœia list, or is recognised under a different name. The following list presents a view of a majority of these cases.

<i>Pharm. Edinburgh, 1817.</i>	<i>Pharm. London, 1824.</i>	<i>Pharm. U.S. 1820, L. 1836 &amp; E. 1841.</i>
Acori Calami Radix.	Calami Radix.	{ Calamus, U.S. Acorus, L. Calamus aromaticus, E.
	Anethi Semina.	Anethum, L., E.
	Asari Folia.	Asarum, L.
Aspidii Filicis Maris Radix.	Pilleis Radix.	{ Filix Mas, U.S. 1830. Aspidium, L. Filix, E.
Avenæ Sativæ Semina.	Aurantii Baccæ.	Aurantium, L.
	Avenæ Semina.	Avena, L., E.
Colombæ Radix.	Calumba.	{ Colomba, U.S. Calumba, L., E.
	Cardamines Flores.	Cardamine, L.
Carui Carui Semina.	Carui Semina.	{ Carum, U.S. Carui, L., E.
Cassie Fistulæ Fructus.	Cassie Pulpa.	{ Cassia fistula, U.S. Cassia, L. Cassiae pulpa, E.
Chironiæ Centaurii Summitates.	Centaurii Cacumina.	Centaurium, L., E.
Menispermi Cocculi Baccæ.		Cocculus, E.
Lichen Islandicus.	Lichen.	{ Lichen, U.S.* Cetraria, L., E.
	Contrajervæ Radix.	{ Contrajerva, U.S. Contrajerva, L.
Bonplandiæ Trifoliatæ Cortex.	Cuspariæ Cortex.	{ Angustura, U.S. Cusparia, L., E.
	Cydoniæ Semina.	Cydonia, L.
	Cumini Semina.	{ Cyminum, L. Cuminum, E.
	Elaterii Pepones.	Elaterium, L.
	Euphorbiæ Gummi-resina.	Euphorbium, L., E.
Fici Caricæ Fructus.	Caricæ Fructus.	{ Ficus, U.S. 1830. Fici, L. E.
Hellebori Nigri Radix.	Hellebori nigri Radix.	{ Melleborus niger, U.S.† Helleborus, L., E.

\* Cetraria is adopted as the name in the U. S. Pharmacopœia of 1842.

† Helleborus in the U. S. Pharmacopœia of 1842.

<i>Pharm. Edinburgh, 1817.</i>	<i>Pharm. London, 1824.</i>	<i>Pharm. U.S. 1820, L.1836 &amp; E.1841.</i>
Humuli Lupuli Strobili.	Humuli Strobili.	{ Humulus, U.S. Lupulus, L., E.
	Mori Baccæ.	Mora, L.
Dolichi Prurientis Pubes.	Doliehi Pubes.	{ Dolichos, U.S.* Mucuna, L., E.
	Opopanax Gummi-resina.	{ Opopanax, L.
Papaveris Somniferi Capsulæ.	Papaveris Capsulæ.	Papaver, L., E.†
	Cubeba.	{ Cubeba, U.S. Piper Cubeba, L.† Cubebæ, E.
	Porri Radix.	Porrum, L.
Pterocarpi Santalini Lignum.	Pterocarpi Lignum.	{ Santalum, U.S. Pterocarpus, L., E.
Anthemidis Pyrethri Radix.	Pyrethri Radix.	Pyrethrum, L., E.†
	Quercus Cortex.	Quereus, L.
	Rhamni Baccæ.	Rhamnus, L.
	Rheados Petala.	Rheas, L., E.
Rosæ Caninæ Fructus.	Rosæ caninæ Pulpa.	{ Rosa canina, L. Rosæ fructus, E.
	Acetosæ Folia.	Rumex, L.
Rutæ Graveolentis Herba.	Rutæ Folia.	Ruta, L., E.†
Sambuci Nigræ Flores.	Sambuci Flores.	Sambucus, L., E.†
Smilacis Sarsaparillæ Radix.	Sarsaparillæ Radix.	{ Sarsaparilla, U.S. Sarza, L., E.
		{ Spartium, U.S. 1830. Scoparius, L. Scoparium, E.
Spartii Scoparii Summitates.	Spartii Cacumina.	Staphisagria, L., E.
Delphinii Staphisagriæ Semina.	Staphisagriæ Semina.	{ Veratrum album, U.S. Veratrum, L., E.
Veratri Albi Radix.	Veratri Radix.	Ulmus, L.
	Ulmi Cortex.	

The want of agreement in the names in the third column of the above table, arises, in several instances, from the generic and specific names of the plants, being, in different cases, selected to express the medicine. In some cases, the name of the U.S. Pharmacopœia, being less concise than that of the last L. and E. Pharmacopœias, seems to be a departure from the principle of nomenclature, recognised from the beginning in our na-

\* *Mucuna* is adopted as the name of this medicine in the U. S. Pharmacopœia of 1842.

† Made official under this name in the U. S. Pharmacopœia of 1842.

‡ Here, unfortunately, the London College have deserted their name of 1824.

tional work; as in the instances of *Helleborus niger* for *Helleborus*, and *Veratrum album* for *Veratrum*. But these longer names were necessary in the U.S. Pharmacopœia, from the fact that two hellebores, and two veratrums were originally recognised as officinal in that work. Two veratrums are still retained; but as *Helleborus fœtidus* has been dismissed upon the recent revision, the single word *Helleborus*, as in the L. and E. Pharmacopœias, now expresses the medicine, formerly called *Helleborus niger*.

The system of concise names for vegetable medicines has generally been followed out by the L. and E. Pharmacopœias, in the nomenclature of the new articles introduced into those works. In proof of this, we subjoin a list of new L. and E. officinals from the vegetable kingdom; the names printed in italics having been previously adopted for the medicines they represent in the U. S. Pharmacopœia:—*Anethum*, E., *Canna* (Tous-les-mois) E., *Chimaphila*, L. (*Pyrola*, E.), *Chiretta*, E., *Cubebae*, E., *Cuminum*, E., *Curcuma*, L., E., *Diosma*, L. (*Bucku*, E.), *Elemi*, E., *Ergota*, L., E., *Euphorbium*, E., *Gossypium* (raw cotton) E., *Krameria*, E., *Laemus*, L., E., *Lactucarium*, L., *Lobelia*, L., E., *Maranta*, L., E., *Nux Vomica*, L., E., *Origanum*, E., *Pareira*, L., E., *Rhoeas*, E., *Sabadilla*, L., E., *Sago*, L., E., *Tapioca*, E. In the U. S. Pharmacopœia, cubebs have been officinal, since 1820, under the name, which they still retain, of *Cubeba*, and ergot, since 1830, first under the name of *Secale Cornutum*, and on the last revision (1842) under the changed name of *Ergota*, to make it conform with the name under which it has been recently admitted into the officinal list of the L. and E. Colleges. Cubebs, when first introduced by the London College, (1824.) were called *Cubeba*, but subsequently (in 1836) was denominated *Piper Cubeba*. This was an injudicious change; for it violated the plan of brief names for vegetable medicines, irrespective of botanical titles, which was adopted for the first time in the London Pharmacopœia of 1836.

In the additions which have been made to the vegetable *Materia Medica* of the U. S. Pharmacopœia of 1842, the

same principle of brevity in nomenclature, enforced and adopted in 1820, in our first Pharmacopœia, and carried out in 1830, has been still adhered to. This is shown by the following list of newly introduced names, those in italics having been previously adopted in one or more of the British Pharmacopœias: *Absinthium*, *Althæa*, *Cataria*, *Chondrus*, *Diosma*, *Matricaria*, *Melissa*, *Panax*, *Papaver*, *Pareira*, *Pyrethrum*, *Ruta*, *Subadilla*, *Salvia*, and *Sambucus*.

Thus then it appears that the principle of brief names for vegetable medicines, independent of botanical titles and changes, has become more and more extended in its application with the appearance of every revised edition of the British and United States Pharmacopœias. This remark does not apply to the Dublin Pharmacopœia, which has not been published since 1826; but it is hoped that a revision of that work, after the lapse of sixteen years, will shortly be made, and that the principle of reform in nomenclature, here advocated, will be adopted and applied as extensively as possible. If this be done, a great advance will be made towards uniformity of names, and the desirable result of one Pharmacopœia for the British Empire.

Our Pharmacy is so connected with that of Great Britain, that we cannot be insensible to the benefits which would accrue from the substitution of one for three British Pharmacopœias. If the three British Colleges could agree upon a common nomenclature, and the discrepancies, in this respect, are every day disappearing, the only remaining task would be to make the equivalent preparations of the three Colleges identical. The common basis of the three Pharmacopœias, having thus the same nomenclature and the same preparations, nothing would remain but to add the medicines and preparations, peculiar to any one, or any two of the works. These additions might be surplusage, in relation to the wants of certain sections of the British Empire; but they would do no harm, so long as every thing that might be wanted by any one section, could be found in the joint work.

With the preceding remarks on the nomenclature of vege-

table medicines, showing the progress of the plan of brief names to designate them, in the adoption of which the framers of the U. S. Pharmacopœia preceded the British Colleges, we dismiss this division of pharmaceutical nomenclature. But the names of the mineral medicines have undergone, at the same time, a favorable change, with the result of lessening the number of synonymes. In proof of this we subjoin some names adopted by two or more of the Pharmacopœias noticed in these remarks; the order of their adoption in the different works being indicated by the order of the initials.

Acidum Arseniosum, U.S., L.; Calcii Chloridum, U.S., L.; Potassæ Bitartras, D., L., E., U.S.; Sodæ Carbonas, D., U.S., L., E.; Sodæ Bicarbonas, D., U.S., E.;\* Sodii Chloridum, U.S., L.; Ammoniae Carbonas, D., U.S., E.;† Liquor Potassæ Arsenitis, U.S., L.; Barrii Chloridum, L., U.S.; Liquor Calcii Chloridi, L., U.S.; Magnesia, L., E., U.S., D.; Potassæ Carbonas, D., U.S., L., E.; Potassæ Bicarbonas, D., U.S., L., E.; Potassii Sulphuretum, L., U.S.

As the Dublin Pharmacopœia was reviewed in the third volume, First Series, of this journal, we shall not further speak of it than to say that the nomenclature of the vegetable *Materia Medica* is sadly in want of reform. From the work as printed, it is almost impossible to tell what name was intended for the vegetable medicines. Thus, for example, we have "*Fœniculum*," with the addition, *Vide* "*Anethum*." Turning to this we find "*Anethum Fœniculum. Semina*." This last phrase is a definition, not a pharmaceutical name; and if we assume "*Fœniculum*" to be the name of the medicine, then we are met with the difficulty that it is called "*Semina Anethi Fœniculi*" at pages 102 and 205, and "*Semina Fœniculi*," at pages 113 and 144. A similar hazardous nomenclature is adopted for nearly all the vegetable medicines, producing the greatest confusion. The framers of a Pharmacopœia should indicate the name which they prefer for a medicine or preparation, and adhere to it throughout the

\* Sodæ Sesquicarbonas, L.

† Ammoniae Sesquicarbonas, L.

work. No alternative of names should be presented in the *Materia Medica* ; and no variation from the fixed name is admissible, when the substance which it represents is recited as an ingredient in a preparation.

The London Pharmacopœia of 1836, the last which has been published, far exceeds, in neatness and the consistency of its different parts, those of Dublin and Edinburgh. The *Materia Medica* contains 267 articles, of which 37 are new. Of the remaining 230 articles, 133 have new names ; so that only 97 substances remained with their names unchanged upon the last revision. This certainly was a very extensive reform in nomenclature, and, with few exceptions, for the better. We have discovered but few errors violating the unity of the work. No substances are employed in the preparations, which do not exist in the officinal catalogue, except the expressed oil of nutmeg, and lettuce (*Lactuca*), both of which have been inadvertently omitted ; although the former is an ingredient in the *Emplastrum Picis*, and the latter is used to make the *Extractum Lactucæ*. In a few instances the officinal name in the *Materia Medica* list has not been exactly followed in the preparations. Thus we have *Catechu* in the *Materia Medica*, and *Catechu Extractum*, at page 100 ; *Cocci*, (*Mat. Med.*) and *Coccus*, pages 169 and 170 ; *Cornu*, (*Mat. Med.*) and *Cornua*, pages 63 and 113 ; *Elaterium*, (*Mat. Med.*), and *Elaterii Pepones*, page 95 ; *Gallæ*, (*Mat. Med.*) and *Galla*, pages 172 and 184 ; *Nux vomica*, (*Mat. Med.*) and *Strychnos Nux Vomica*, page 60 ; *Piper Cubeba*, (*Mat. Med.*) and *Cubeba*, page 172 ; *Saccharum*, (*Mat. Med.*) and *Saccharum purificatum*, page 143 ; *Sambucus*, (*Mat. Med.*) and *Sambuci Flores*, page 66.

In the *Materia Medica*, the oils are expressed by Latin names, with the word *oleum* printed last,—in the titles of the preparations, with the same word printed first ; and where an oil is recited as an ingredient of a preparation, some of them are printed, in different places, with the words in both orders. Thus *Cinnamomi Oleum* of the *Materia Medica* is twice

printed thus in the preparations, and once, at page 65, *Oleum Cinnamomi*; and *Oleum Anisi*, *Oleum Carui*, *Oleum Lavandulæ*, *Oleum Menthæ Piperitæ*, *Oleum Rosmarini*, and *Oleum Succini*, the recognised titles of these oils as distinct preparations, are expressed, in the body of some of the formulæ, with the words in the reverse order. A similar slight discrepancy obtains in regard to solution of ammonia, which is recognised under the title of *Liquor Ammoniz*, and recited in two formulæ, pages 55 and 61, as *Ammoniz Liquor*. The error in regard to *galls* leads to a mistake in the title of two preparations; for if *Gallæ*, in the plural, is the name of the medicine, we should expect to have *Tinctura Gallarum*, and *Unguentum Gallarum Compositum*, instead of *Tinctura Gallæ*, and *Unguentum Gallæ Compositum*. Again, if *Piper Cubeba* is to be the name of cubeb, then the London College should call the tincture, *Tinctura Piperis Cubebæ*, instead of *Tinctura Cubebæ*; on the same principle that they have *Confectio Piperis Nigri*. Objection may be made to the title *Syrupus Aurantii*, for a syrup made with orange peel; for, as the College recognises the fruit and the rind of the fruit, under the names of *Aurantium* and *Aurantii Cortex*, "*Syrupus Aurantii*" would seem more appropriately to designate a syrup made from the juice of the fruit, than from the peel.

The errors here pointed out in the London Pharmacopœia, consist in a want of consistency of the work with itself. The nomenclature of the *Materia Medica*, and of the preparations must be assumed to have the preference of the College, and should have been carefully adhered to throughout the work. But the nomenclature, even if consistently carried out, still presents some defects, which we shall briefly point out.

The plan of having the names of the substances in the singular number, as had been previously done in the U. S. Pharmacopœia, is carried out to a considerable extent by the London College, in the last revision of their Pharmacopœia. In obedience to this plan they now have *Amygdala*, *Caryophyllus*, *Cornu*, and *Uva*, for *Amygdalæ*, *Caryophylli*, *Cornua*,

and *Uvæ passæ*, of their former Pharmacopœia. But it may be asked, why have they not adopted *Coccus*, *Ficus*, *Galla*, *Limon*, *Morum*, *Prunum*, and *Testa*, for *Cocci*, *Fici*, *Gallæ*, *Limones*, *Mora*, *Pruna*, and *Testæ*. *Coccus* and *Galla* were probably intended to be used; for these names are always employed in the singular in the preparations, and *Coccus* was the name in the Pharmacopœia of 1824. If *Aurantium* be correctly applied by the College as the name for *orange*, surely *Limon* must be the correct name for *lemon*, *Ficus* for *figs*, *Morum* for *mulberry*, and *Prunum* for *prunes*. Indeed, "*Morum*" is the officinal title for *mulberry*, so far as it may be inferred from the name of one of the preparations, "*Syrupus Mori*." To be consistent with the title for *mulberry* in the *Materia Medica*, "*Mora*," the name of this preparation should have been *Syrupus Mororum*, like "*Syrupus Limonum*."

The London College have committed an error in calling the fruit of the *Momordica Elaterium*, by the name of *Elate-rium*, and the medicine, which is universally called *elaterium*, by the title of *Extractum Elaterii*. The substance deposited from the juice of the wild cucumber is not, properly speaking, an *extract*. This attempt to give a new meaning to the word *elaterium* cannot succeed. The College, no doubt, felt it themselves to be a difficulty, when they begin the formula for their so-called extract of *elaterium*, with the words "*Elaterii Pepones scinde*," instead of "*Elaterium scinde*."

The London College have included *Limonum Succus* in the list of the *Materia Medica*. If this be right, then "*Mororum Succus*" and "*Rhamni Succus*," titles used in the preparations at page 161, should have been included also. The *Materia Medica* list would have been rendered more complete by the insertion of "*Aqua*," as is done in the U. S. Pharmacopœia, and recently in that of Edinburgh. The London College have committed an oversight in the formula for *Ceratum Calaminæ*, in which "*Calamina*" is used, instead of "*Calamina Præparata*." "*Unguentum Zinci*" is an injudicious name for an ointment, made of oxide of zinc and lard.

*Unguentum Zinci Oxydi* would have been a better title. In the "compound tincture of ammonia," two ounces, instead of two drachms, of mastich are ordered. This error has been corrected by Mr. Phillips, in his authorized translation of the London Pharmacopœia.

We have already mentioned that the Edinburgh Pharmacopœia was revised in 1839, and that a second edition of the revised work appeared in 1841. On this second edition we propose to make some remarks. The work is not well edited, and many small details, trifling individually, but important in the aggregate, have been but imperfectly attended to. The typography is not executed according to a consistent plan. The general plan is to print genitives with *ae*, instead of the diphthong *æ*; yet this rule is violated always in the Index, and frequently throughout the body of the work. In reciting the ingredients of preparations, the unit of weight or measure is expressed, indifferently, in two ways: as "a drachm," "one drachm;" "an ounce," "one ounce;" "a pint," "one pint," &c. Now neatness required the adoption of the first or second way exclusively, and good usage would have declared for the first.

The following misprints occur in the work:—page 42, *Terebintha Chia*, for *Terebinthina Chia*; page 56, *Spiritus Dilutior*, for *Spiritus Tenuior*; page 96, *Antimonii Tartarizatum*, for *Antimonium Tartarizatum*; page 98, *Compound Tincture of Lavender*, for *Compound Spirit of Lavender*; page 178, *Tincturae Senna Composita*, for *Tinctura Sennae Composita*; page 195, *Aqua Potassæ Effervescens* and *Aqua Sodæ Effervescens*, for *Potassae Aqua Effervescens* and *Sodæ Aqua Effervescens*; page 196, *Citrus Medicæ Fructus*,\* for *Citri Medicæ Fructus*,—*Convolvulus Scammonii Gummi-resina*, for *Convolvuli Scammoniae Gummi-Resina*,—*Decoctum Althææ*, for *Decoctum Althææ Officinalis*,—*Decoctum Hordei Comp.*, for *Decoctum*

\*This is given in the column of *old names*; but lemons were not official in the last Ed. Pharmacopœia.

*Hordei Distichi*; p. 197, *Oxidum Hydrarg. Rubri per Acid. Nit.*, for *Oxidum Hydrarg. Rubrum per Acid. Nit.*,—*Oxidum Hydrargyri Rubri*, for *Hydrargyri Oxidum Rubrum*,—*Pini Balsamei Resina*, for *Pini Balsameæ Resina*; page 198, *Spartii Scoparii Cucumina*, for *Spartii Scoparii Summitates*,—*Submurias Hydrargyri*, for *Sub-Murias Hydrargyri Mitis*,—*Tinctura Cascarilla*, for *Tinctura Cascarillæ*,—*Unguentum Nit. Hydrarg.*, for *Unguentum Nit. Hydrarg. Fortius*. Besides, there are a number of misprints in the names and references of the Index.

The Latin nomenclature is, in many instances, inconsistent with itself. In support of this criticism, the following instances may be adduced: Spirit of Ammonia is *Ammonia Spiritus* in the Materia Medica, and *Spiritus Ammoniae* in the Preparations. The following are similar discrepancies:—*Aqua Ammonia* and *Aqua Ammoniae Fortior*, (Materia Medica), *Ammoniae Aqua* and *Ammoniae Aqua Fortior*, (Preparations); *Plumbi Diacetatis Aqua*, (Mat. Med.), *Plumbi Diacetatis Solutio*, (Prep.); *Aqua Ammonia Acetatis*, (Mat. Med.), *Ammoniae Acetatis Aqua*, (Prep.); *Aqua Potassae*, (Mat. Med.), *Potassae Aqua*, (Prep.); *Copaibae Oleum*, (Mat. Med.), *Oleum Copaibæ*, (Prep.) Almonds are expressed by the Latin singular *Amygdala*, and yet, in the Preparations, the Edinburgh College have given us the titles of *Conserva Amygdalarum*, and *Mistura Amygdalarum*, instead of *Conserva Amygdalæ*, and *Mistura Amygdalæ*. Again, *Gallae* is the Ed. officinal name for galls; but the name is in one instance not consistently carried out; for we have as a preparation, *Unguentum Gallae et Opii*. In the case, however, of the tincture, the name is consistently given,—*Tinctura Gallarum*. The oil of cubebs is directed to be obtained according to a general formula, given under the head of "Volatile Oils." Its Latin officinal name, from the manner in which these oils are enumerated, is not distinctly indicated; but as *Cubebæ* is given as the name of cubebs, the oil should be called, to be consistent, *Oleum Cubebarum*. This name, however, is not recognised by Dr. Christison, who gives, in his

Dispensatory, *Oleum Cubebæ*, as the Edinburgh officinal name. All these discrepancies would disappear by adopting either the singular or plural throughout the names; but we should much prefer the use of the singular number.

The seculence of the juice of the fruit of *Momordica Elaterium* is judiciously called, in the *Materia Medica*, simply *Elaterium*; but when, under the preparations, directions are given for obtaining this seculence, the two names are given, *Extractum Elaterii seu Elaterium*. Now these are inconsistent names; for if *Elaterium* means the seculence, *Extractum Elaterii* must mean something drawn from the seculence. The name given to red precipitate is *Hydrargyri Oxidum Rubrum*, and to the ointment made from it with lard, *Unguentum Oxidi Hydrargyri*. This latter name, to make it correspond with other similar names, should have been *Unguentum Hydrargyri Oxidi*.

So much for the inconsistencies which are apparent in the Latin nomenclature of the Edinburgh Pharmacopœia; but there are other defects in the nomenclature, some of which we shall now proceed to indicate.

For the preparation of phosphate of soda and extract of stramonium, bone, and the seeds of stramonium are severally directed, but neither is enumerated as officinal. Hence it would be proper to introduce into the *Materia Medica* list, the titles, *Os* and *Stramonii Semen*. If the latter title were introduced, *Stramonium* would require to be changed to *Stramonii Folia*.

For expressing solution in water three words have been used in the Pharmacopœias,—*Aqua*, *Solutio*, and *Liquor*. The Edinburgh College do not seem to give a preference to any one of these words, but use them all in different cases. Thus they have *Aqua Ammoniz*, *Aq. Ammoniz Fortior*, *Aq. Ammoniz Acetatis*, *Aq. Potassæ*, *Aq. Calcis*, *Chlorinei Aq.*, *Plumbi Diacetatis Aq.*, *Ammoniz Carbonatis Aq.*, *Ammoniz Acetatis Aq.*, *Potassæ Aq. Effervescens*, and *Sodæ Aq. Effervescens*. Using "*Solutio*," they have *Solutio Barytæ Muriatis*, *Sol. Argenti Nitratis* (test),

*Sol. Argenti Ammoniati* (test), *Sol. Barytae Nitratis* (test), *Sol. Sodae Phosphatis* (test), *Morphiae Muriatis Sol.*, *Calcis Muriatis Sol.*, *Cupri Ammoniati Sol.*, *Plumbi Diacetatis Sol.* Using "Liquor," they have *Liquor Arsenicalis* and *Iodinei Liquor Compositus*. Certainly, in a work intended as a standard of Pharmacy for Scotland, greater uniformity was to be expected. One mode of expression in these cases should have been selected, and uniformly employed. As "Aqua" is now universally applied to the "distilled waters," and as "Solutio" is not good Latin for "solution," the Edinburgh College would have acted wisely, if in their late revision they had followed the example of the London College, in invariably using the word "Liquor."

In the titles of two preparations, dried alum and dried sulphate of iron, "*exsiccatum*" is used to signify "dried;" in the title of a third, dried carbonate of soda, "*siccatum*" is employed. The nomenclature would have been neater, if "*exsiccatum*" had been employed here also.

To express the vegetable medicines, the general principle, adopted successively by the U. S. and London Pharmacopœias, of using a single name where one part only of a plant, or one species of a genus is used medicinally, is usually acted upon by the Edinburgh College, but violated in a few instances. Thus we find in the Materia Medica list, *Calamus aromaticus* for *Calamus*; *Cassiae cortex* for *Cassia*; *Cassiae pulpa* for *Cassia Fistula*; *Dauci radix* for *Carota*; *Glycyrrhizae radix* for *Glycyrrhiza*; *Gummi acaciae* for *Acacia*; *Quercus cortex* for *Quercus*; *Rhamni baccae* for *Rhamnus*; *Rosae fructus* for *Rosa Canina*; *Salicis cortex* for *Salix*.

To the chemical nomenclature of the Edinburgh Pharmacopœia many exceptions may be justly taken. For its defects a sort of apology is made in the Preface, consisting in the allegation that it is impossible to follow the nomenclature of the chemist, without too frequent and violent changes. Indeed the opinion is expressed, that a great error was committed when chemical terms were first introduced into phar-

maceutical nomenclature. We are willing for the moment to admit these positions, and to judge the labours of the College by the manner in which they have carried out their own peculiar opinions.

The views, then, of the Edinburgh College are that changes of nomenclature are to be avoided, and that a chemical nomenclature is not a good one, because it is liable to frequent changes. With these views, the College had to decide, 1st. What should be done with the chemical names heretofore adopted? 2d. What names should be given to chemical substances newly introduced? The natural decision under the first question was to leave the existing chemical names unchanged; or, if they had become absurd, or inadmissible from whatever cause, to fall back upon non-chemical names, but never to substitute one chemical name for another. The College have left very few of their old chemical names unchanged, even if we consider the titles of the salts to have undergone no essential change by having the base in Latin expressed first instead of last. In a few cases, the changes have been from chemical to non-chemical names, of which the following are examples:—*Arsenicum album*, *Aerugo*, *Borax*, *Calamina præparata*, *Calomelas*, *Cinnabaris*, *Creta*, *Lithargyrum*, *Sublimatus corrosivus*; but in the majority of instances, where changes have been made, a new chemical name has been substituted for the old one, contrary to the principles which appear to have guided the College. Thus they have substituted *Ammoniae carbonas* for *Sub-Carbonas Ammoniae*; *Potassae bicarbonas* for *Carbonas Potassæ*; *Potassae bitartras* for *Super-Tartras Potassæ*; *Potassae carbonas* for *Sub-Carbonas Potassæ*; *Sodae bicarbonas* for *Carbonas Sodæ*; *Sodae carbonas* for *Sub-Carbonas Sodæ*; *Spiritus ætheris nitrici* for *Spiritus Ætheris Nitrosi*, &c. We approve of these changes; but are they consistent with the objections of the College to chemical nomenclature, founded on its instability? The old names might have been retained, or, if inadmissible, names inexpressive of composition might

have been employed. For consistency sake the College should have restored such terms as *Sal Volatilis*, *Cremor Tartari*, *Sal Tartari*, *Natron Præparatum*, *Spiritus Nitri Dulcis*, &c.

The names given to chemical substances, newly introduced, are sometimes chemical and sometimes arbitrary. Examples of the former are, *Acidum Hydrocyanicum*, *Antimonii oxidum*, *Calcis murias*, *Ferri carbonas saccharatum*, *Ferri iodidum*, *Hydrargyri biniodidum*, *Manganesii oxidum*, *Morphiæ acetas*, *Morphiæ murias*, *Plumbi diacetatis aqua*, *Plumbi iodidum*, *Plumbi nitras*, *Potassæ bisulphas*, *Potassii ferrocyanidum*, *Potassii iodidum* and *Quinæ sulphas*. Instances of arbitrary names are, *Bismuthum album*, *Calx chlorinata*, *Ferrugo*, *Hydrargyri præcipitatum album*, and *Liquor arsenicalis*. Here it is perceived that the chemical substances newly introduced have, in a majority of cases, chemical names, notwithstanding the objection of the College on account of their liability to change.

The true point of view in which to consider this subject, is that chemical nomenclature in Pharmacy is necessary, and can neither be laid aside as applied to old chemical substances, nor avoided upon the introduction of new ones into the *Materia Medica*. Good sense, however, forbids the adoption of every change and every little nicety of chemical nomenclature. Pharmaceutical convenience must be allowed to modify the strictly scientific nomenclature; and this necessity has been repeatedly felt and acted upon.

We do not object, therefore, to the nomenclature of the Edinburgh Pharmacopœia in regard to chemicals, because it is not strictly scientific; but because it is not carried out on any consistent plan. It is, indeed, what the framers of it have themselves characterized it to be in their Preface, "a patchwork of which they cannot boast." Its want of unity is, doubtless, the effect, not of design, but rather of inattention to the demands of the work as a whole, while the revisers were occupied with the details of its parts.

When it is borne in mind that a number of the old chemical names are changed for new chemical names, and that chemical titles are given to nearly all the chemical substances, newly introduced; it was to be expected that the nomenclature, so far as employed, would be consistent with itself, and that chemical names would not be rejected on slight grounds. Yet this reasonable expectation has not been realized in the nomenclature of the College. As they had newly adopted the names, *Ferri iodidum*, *Hydrargyri biniodidum*, *Plumbi iodidum*, *Potassii ferrocyanidum* and *Potassii iodidum*, they would only have proceeded somewhat further in the same path, if they had adopted *Barii Chloridum* for *Barytæ murias*, *Calcii Chloridum* for *Calcis murias*, *Ferri Chloridi Tinctura* for *Ferri muriatis tinctura*, and *Sodii Chloridum* for *Sodæ murias*. In relation to arbitrary names, we are willing to admit that their use is expedient for chemical substances of doubtful composition, or having long scientific names; but the Edinburgh College have employed them in other cases. If "*Oxidum Arsenici*" must be changed, as we admit it should be, it does not follow that "*Arsenicum album*" is a good substitute. The College recognise a class of officinal acids, and, on the occasion of the recent revision, introduced a new one, "*hydrocyanic acid*." Under these circumstances, it was natural to expect that the substance in question would have been named *Acidum Arseniosum*, more especially as its chemical name is not a matter of dispute, and as this is the name adopted in the U. S. and London Pharmacopœias. Again, "*Cinnabaris*" is adopted for the red sulphuret of mercury; but surely, if the College are willing to have a red oxide of mercury (*Hydrargyri oxidum rubrum*), they might have admitted a red sulphuret of

\* They also introduced the impure acetic acid, obtained by the destructive distillation of wood, under the very exceptionable title of "*Acidum Pyroligneum, pyroligneous acid*." Strictly speaking, there is no such acid, and the construction of its name would lead to the supposition that there existed a *pyrolignic acid*. Besides, *Pyroligneosum* is the proper Latin translation of *pyroligneous*.

mercury under the name of *Hydrargyri Sulphuretum Rubrum*.\* "Bismuthum album" is a very objectionable name, especially as "Bismuthum" is recognised as the name of the metal itself. Under the doubt which was probably felt, as to the proper designation for this substance, now first introduced into the Ed. Pharmacopœia, it would have been judicious to adopt the name of the London Pharmacopœia, and thus secure the advantage, so far as it goes, of uniformity of nomenclature. Similar views should have induced the Edinburgh College to adopt the London name for Fowler's solution, *Liquor Potassæ Arsenitis*.† The name "Sublimatus corrosivus," even as an arbitrary name, seems deficient in precision, and requires the prefix *Hydrargyri* at least as much as the name of *white precipitate*, which is called by the Edinburgh College "*Hydrargyri precipitatum album*." If there are more than one "white precipitate," so also there are more than one "corrosive sublimate;" and the prefix, "*Hydrargyri*," is not less necessary to the one name than to the other.

We have already mentioned that the recent edition of the Edinburgh Pharmacopœia is the first that has been printed in the English language. This reform was half adopted, so to speak, in the first and second U. S. Pharmacopœias, which were printed with Latin and English on opposite pages; and has been fully carried out in the third, recently published, in conformity with the example of the Edinburgh Pharmacopœia. This change has very properly not been extended to the Latin nomenclature, which is preserved; but the details of the several processes are given in English. As the various processes necessarily contain an enumeration of the different officinal substances and preparations which are essential either as ingredients or agents, and as the names of these must be given in English, as well as the mere directions of

\* This was the name of the Ed. College, in their first revised edition, (1839.)

† This name was first adopted in the U. S. Pharmacopœia of 1830, and in the London Pharmacopœia of 1836. By a misprint, this solution was called "*Liquor Potassæ Arseniatis*" in the U. S. Pharm. of 1820.

the mode of proceeding; the necessity is obvious for the translation into English of all the Latin titles of substances, &c., thus enumerated. A large majority of the names of the medicinal substances being thus necessarily rendered into English in the body of the work, there seems to be an obvious propriety of rendering them all in the same language, and, at the same time, in a uniform manner. The framers of a Pharmacopœia printed in English, recognising the necessity of English names by their employment to a partial extent, might well adopt them universally; and doing so, the propriety would naturally present itself of selecting them according to a system, and adhering to them invariably. Such a system of names might be called the *English Official names*, as having the sanction of the authors of the Pharmacopœia.

Such being our views, we shall proceed to make a few remarks on the Edinburgh Pharmacopœia, in relation to its use of English names. These names are used in the *Materia Medica* list, in the body of the different formulæ, and in the Index. The Latin titles of the different preparations are not given in English at the head of the formulæ, but are rendered into English in the Index, and whenever the preparations themselves happen to be placed in the *Materia Medica* list, or enumerated in the various formulæ. In this way all the Latin names are translated, sometimes in the Index alone, sometimes in the Index and *Materia Medica* list, and at other times, in both these and the body of the formulæ also. It is certainly an unusual course that the Index should contain English names, referring to certain pages at which those names are not to be found, but only the Latin titles, of which they are the translations. But this defect might be overlooked, if the English names for the same substance were uniform. Unfortunately, this is not the case; for we have, in numerous instances, several English names to express the same article.

In proof of this we shall give a few examples:—*Aloe barbadensis* is called *Barbadoes aloes* in the *Materia Medica*,

and *Hepatic Aloes* at p. 71; *Althææ folia*, *Marsh-mallow* in the Mat. Med., and *Marsh-Mallow Leaves* in the Index; *Althææ radix*, *Marsh-mallow* in the Mat. Med., and *Marsh-Mallow Root* in the Index; *Anethum*, *Dill* in the Mat. Med., and *Anethum seeds* at p. 75; *Aqua ammoniæ fortior*, *Strong ammoniæ* in the Mat. Med., and *Stronger Solution of Ammonia* in the Index;\* *Arsenicum album*, *Arsenious acid* in the Mat. Med., *White Arsenic* at p. 98, and *Arsenic* in the Index; *Aurantii cortex*, *Bitter orange rind* in the Mat. Med., *Bitter orange-peel* in the Preparations, and *Orange-peel* in the Index; *Cardamomum*, *Cardamoms* in the Mat. Med., *Cardamom seeds* in numerous places in the Preparations, *seeds of Cardamoms*, p. 166, and *Cardamom* in the Index; *Digitalis*, *Foxglove* in the Mat. Med., *leaves of Digitalis* at p. 81, and *Digitalis* at pp. 91, 139, and 171; *Ferri muriatis tinctura*, *Tincture of iron* in the Mat. Med., and *Tincture of Muriate of Iron* in the Index; *Guaiaci lignum*, *Lignum-vitæ* in the Mat. Med., and *Guaiac* at pp. 72 and 73; *Hyoscyamus*, *Henbane* in the Mat. Med., *leaves of Hyoscyamus* at p. 82, and *Hyoscyamus* at p. 172; *Krameria*, *Rhatany-root* in the Mat. Med., and *Krameria-root* at p. 83; *Limonum oleum*, *Oil of Lemons* in the Mat. Med., *Volatile oil of Lemon-peel* at p. 151, and *Volatile oil of Lemons* at p. 181; *Myristicæ adeps*, *Concrete oil of nutmeg* in the Mat. Med. and Index, and *Oil of mace* at p. 146; *Rosa gallica*, *Red-rose* in the Mat. Med., *Rosa gallica* at p. 93, and *Red rose-petals* at p. 158; *Saccharum purum*, *White sugar* in the Mat. Med. and at pp. 68, 69, 70 and 103, *Pure sugar* in numerous places, and *Sugar* at pp. 124, 156 and 178; *Spiritus ætheris nitrici*, *Spirit of nitrous ether* in the Mat. Med., and *Spirit of Nitric Ether* in the Index; *Tamarindus*, *Tamarind-pulp* in the Mat. Med. and Index, and *Tamarinds* at p. 93; *Cinnabaris*, *Cinnabar* in the Mat. Med., and *Sulphuret of Mercury* in the Index; *Mucilago*, *Mucilage* at pp.

\* At pages 104, 106, and 127, in the body of certain formulæ, it is called by the mongrel title of "Stronger Aqua Ammoniæ."

121, 123, and 124, and *Mucilage of Gum-arabic* in the Index; *Pulvis ipecacuanhae compositus*, *Powder of Ipecacuan and Opium* at p. 140, and *Compound Ipecacuanha Powder* in the Index; *Syrupus simplex*, *Syrup* at pp. 90, 123, and 156, and *Simple syrup* at p. 160. The minor discrepancies in English nomenclature are innumerable. It may be alleged, however, that these discrepancies were intended; various English names for the same thing having been given, either to identify the substances meant, or to render the Index more copious and useful. Now we have no objection to English synonymes in certain cases, printed in a subordinate type; but the framers of an English Pharmacopœia should adopt a system of English names, which should be printed in a uniform type, and which should always be adhered to, whenever it is intended to represent the same substance. The following extracts, printed as they appear in the *Materia Medica* list, show in what a slovenly manner it is drawn up.

"ARSENICUM ALBUM. Sesquioxide of arsenic; *Arsenious acid.*"

"BARYTÆ MURIAS. *Chloride of barium.*"

"BISMUTHUM ALBUM. *Trisnitrate of bismuth.*"

"CALCIS MURIAS. [CRYSTALLIZATUM.] *Hydrochlorate of lime.*"

"HYDRARGYRI OXIDUM RUBRUM. Binoxide of mercury. *Red Precipitate.*"

"POTASSII IODIDUM. *Iodide of potassium: hydriodate of potash.*"

"POTASSII SULPHURETUM. A mixture of sulphate of potash with persulphuret of potassium. *Sulphuret of potash.*"

"SODÆ MURIAS. Impure commercial chloride of sodium. *Salt.*"

"SODÆ MURIAS PURUM. *Chloride of sodium.*"

"SUBLIMATUS CORROSIVUS. Bichloride of mercury. *Corrosive-sublimate.*"

The italics in a majority of cases very properly represent

the English translation of the Latin names; but in the above examples this is not the case, except in two instances, in one of which the synonyme given is also in italics. For "Potassae sulphas cum sulphure," no translation is given except in the Index. The name of the preparation called "Spiritus ammoniae foetidus" is nowhere rendered in English except in the Index, and there it is called *Ammoniated spirit of Assafœtida*, the former name of the Pharmacopœia.

No definite nomenclature, either in Latin or English, is given for a majority of the volatile oils. Nearly the whole of them are enumerated under the head of "Volatile Oils," at pages 185, 186, and directed to be obtained from certain specified parts of the appropriate plants, designated by their *botanical* names, in the manner directed by a general formula which is given. Here we perceive a departure from the plan of nomenclature of the College, which designates the parts of plants medicinally used, whenever practicable, by a single word; as *Anthemis* for *Chamomile*, and so of the rest. Thus, instead of saying that by pursuing a general formula, a volatile oil may be obtained "from the flowers of *Anthemis nobilis*," the directions should have read "from *Chamomile*," which means the *flowers of Anthemis nobilis*. The same remark applies to all the volatile oils here enumerated. The Latin and English officinal names should have been inserted. The former are nowhere specially given, and the latter are only to be inferred from the names used in the body of the formulæ or in the Index; and the names, thus given, do not always agree.

The Edinburgh College have made a number of additions to their officinal catalogue. We subjoin a list of the most important of these additions, indicating, by initials, the substances which were previously included in the lists of the Dublin, London, and United States Pharmacopœias. The order of the initials shows the order of time in which the several articles were adopted in the works to which they refer. The absence of all initials of course indicates an article not in-

cluded in these works. Acidum Pyroligneum,\* U.S.† Acidum Tartaricum, L., D., U.S. Aqua Ammoniae Fortior, L.‡ Anethum, L. Aqua, U.S. Bergamotae Oleum, L. Bismuthum, U.S., L., D. Canna. Carbo Animalis, U.S., L. Dauci Radix, L. Pyrola, U.S., L. Chiretta. Cassiae Oleum. Colchici Semina, L., D., U.S. Creasotum, L.‡ Cubebae, U.S., L., D. Curcuma, U.S., D., L. Cuminum, L. Bucku, D., L.‡ Elemi, L., D. Euphorhium, L., D. Gossypium (raw cotton). Granati Radix, D.‡ Iodineum, D., U.S., L. Krameria, L., D., U.S. Lacmus, L., D. Lobelia, U.S., L. Manganesii Oxidum, L., D. Maranta, U.S., L. Nux-vomica, U.S., L., D. Copaibae Oleum. Myristicae Adeps, U.S.§ Rosae Oleum.‡ Crotonis Oleum, L., D., U.S. Origanum, L., D., U.S. Ovum, L. Pareira, L.‡ Pix Arida, L. Potassii Ferrocyani-dum, L.‡ Lauro-cerasus, D. Rhoëas, L., D. Sabadilla, L.‡ Sago, U.S., L. Ergota, U.S., L. Tapioca, U.S. Terebinthina Chia, L., D. Acetum Cantharidis, L. Acetum Colchici, L., D., U.S. Acetum Opii, D.|| Acidum Hydrocyanicum, U.S., D., L. Aqua Anethi, L. Aurantii Aqua, L. Aqua Cassiae. Chlorinei Aqua, D. Aqua Foeniculi, L., D.‡ Aqua Lauro-cerasi, D. Aqua Sambuci, L. Bismuthum Album, U.S., L., D. Calx Chlorinata, L.‡ Carbo Animalis Purificatus, L.‡ Conserva Amygdalarum, L.‡ Electuarium Aromaticum, L., D., U.S. Electuarium Piperis, L., D. Cupri. Ammoniaci Solutio, L., D. Decoctum Aloës, L., D. Decoctum Dulcamarae, L., U.S., D. Decoctum Haematoxyli, U.S. Decoctum Papaveris, L., D. Decoctum Sarzae Compositum, L., D., U.S. Decoctum Scoparii, L. Decoctum

\* The names given are those of course of the Ed. Pharm., and the initials which follow indicate the Pharmacopœias in which the same substances were previously included, though not necessarily under the same name.

† Dismissed from the U. S. Pharm. of 1842.

‡ Made official in the U. S. Pharm. of 1842.

§ Dismissed from the U.S. Pharm. of 1842, and the volatile oil substituted.

|| Made official in the U.S. Pharm. of 1842, after having been dismissed from that of 1830.

Taraxaci, D.\* Emplastrum Ammoniaci et Hydrargyri, L., D. Emplastrum Belladonnae, D., L.\* Emplastrum Picis, L. Enema Catharticum, D. Enema Foetidum, D. Enema Opii, D., L. Enema Tabaci, L., U.S., D. Enema Terebinthinae, D., L. Extractum Aconiti [Alcoholicum\*]. Extractum Colchici Aceticum, L. Extractum Colocynthis, L., D. Extractum Digitalis, L. Extractum Lupuli, L., D. Extractum Krameriae.\* Extractum Nucis-vomicae, D.\* Extractum Opii, L., D. Extractum Pareiræ, L. Extractum Quassiae, U.S. Extractum Rhei, L., D. Extractum Sarzae Fluidum, D. Extractum sive Resina Scammonii. Extractum Stramonii [Seminis], L., D.\* Extractum Styracis. Extractum Taraxaci, L., D., U.S. Ferri Carbonas Saccharatum. Ferri Iodidum, L.\* Ferrugo (hydrated sesquioxide of iron\*). Ferri Iodidi Syrupus.† Hydrargyri Biniodidum, L.\* Hydrargyri Precipitatum Album, L., D., U.S. Infusum Cuspariae, L., U.S., D. Infusum Aurantii, L., D. Infusum Bucku. Infusum Calumbae. Infusum Caryophylli, L., D.\* Infusum Cascarillæ, L., U.S., D. Infusum Chiretiae. Infusum Pareirac, L. Infusum Senegae. Infusum Serpentariae, U.S., L. Infusum Simarubae L., D. Iodinei Liquor Compositus, L.\* Linimentum Ammoniae Compositum (Granville's lotion). Linimentum Terebinthinatum, L., U.S., D. Mistura Camphorae cum Magnesiâ, D. Mistura Creasoti. Mistura Ferri Composita, L., D., U.S. Mistura Guaiaci, L. Mistura Scammonii. Morphiae Acetas, U.S., L. Morphiae Murias, L.\* Rutae Oleum, D. Pilulae Aloës et Ferri. Pilulae Calomelanos et Opii. Pilulae Colocynthis et Hyoscyami. Pilulae Digitalis et Scillae. Pilulae Ferri Carbonatis. Pilulae Ipecacuanhae et Opii. Pilulae Plumbi Opiatae. Pilulae Rhei.\* Pilulae Rhei et Ferri. Pilulae Styracis, L., D. Plumbi Iodidum, L. Plumbi Nitrates. Potassae Bisulphas, L., D. Potassii Iodidum, D., U.S., L. Pulveres Effervescentes. Pulvis Cretae Opiatus, L., D. Pulvis Rhei Compositus. Pulvis

\* Made official in the U.S. Pharm. of 1842.

† This has been substituted for the Ferri Iodidi Solutio (called Liquor in the Materia Medica list,) of the first edition of the revised Edinburgh Pharmacopœia, (1839.)

Tragacanthæ Compositus, L. Quinae Sulphas, D., U.S., L. Sodæ Carbonas Siccum, L., D., U.S. Sodæ Murias Purum. Spiritus Cassiæ.† Strychnia, L.\* Syrupus Croci, L. Syrupus Ipecacuanhæ.\* Syrupus Rhamni, L., D. Syrupus Rhoeados, L., D. Tinctura Aurantii, L. Tinctura Bucku, D. Tinctura Capsici, L., U.S., D. Tinctura Cardamomi Composita, L., D. Tinctura Cassiæ. Tinctura Colchici [Seminis], D., L.\* Tinctura Iodinei, D., U.S. Tinctura Lactucarii. Tinctura Lobeliae, U.S. Tinctura Lobeliae Aetherea. Tinctura Quassiae Composita. Tinctura Valerianæ, L., D., U.S. Trochisci Lactucarii. Trochisci Morphiae. Trochisci Morphiae et Ipecacuanhæ. Trochisci Sodæ Bicarbonatis. Unguentum Cocculi. Unguentum Creasoti, L.\* Unguentum Gallæ et Opii, L. Unguentum Precipitati Albi, L., D., U.S. Unguentum Iodinei, D.\* Unguentum Antimoniale, D., L.\* Veratria, L.\* Vinum Colchici, U.S., L.

Most of the substances in the above list are taken from other Pharmacopœias. The length of the list, though incomplete, shows how necessary the revision of the Ed. Pharmacopœia had become, after the lapse of twenty-two years. The articles derived from the works indicated by the initials, require no further notice; but a few of those which are not so derived may be briefly commented on.

**CANNA.** *Tous-les-mois.* This is the starch of the *Canna Coccinea*, a substitute for arrow-root, from which it is not easily distinguished, except by the large size of its globules under the microscope, and their glistening appearance to the naked eye. According to Dr. Christison, it makes a stiffer jelly than arrow-root.

**CHIRETTA.** *INFUSUM CHIRETTÆ.* *Chiretta.* *Infusion of Chiretta.* The Chiretta was first described by Fleming in the Asiatic Researches, under the name of *Gentiana Chirayta*. It was afterwards separated from the gentians by Mr. Don, who formed it into a new genus under the name of *Agathotes Chirayta*. It grows in India, and is much es-

\* Made official in the U.S. Pharm. of 1842.

teemed by the British practitioners in Bengal. It has the general properties of the gentians, being a pure bitter, and, medicinally, a tonic and stomachic. The trials made with it in Edinburgh are stated to have confirmed the favorable accounts received of its efficacy. The herb and root are the officinal parts. The infusion is made with four drachms of the medicine to twenty fluidounces of boiling water. Dose, from one to three fluidounces, taken half an hour before meals.

**COPAIBAE OLEUM.** *Oil of Copaiva.* This is best obtained by distilling copaiva with water. It is usually colourless, and has the pure odour of copaiva. Its density is .910. In composition it is a carbo-hydrogen, identical with pure oil of turpentine. The dose is from five to thirty drops. Its advantages over copaiva are its less offensiveness to the stomach, and its smaller dose.

**EXTRACTUM sive RESINA SCAMMONII.** *MISTURA SCAMMONII.* *Extract or Resin of Scammony.* *Scammony Mixture.* The scammony of commerce is very impure. This was proved by analyses made by Dr. Christison in 1835. It is no doubt to avoid the impurities that the Ed. College have introduced a process for obtaining the pure resin. It consists in boiling finely powdered scammony in successive portions of proof spirit, as long as it dissolves anything; then distilling the liquid until little else but water passes over; next decanting the watery solution, which contains gum, from the resin which has precipitated, and finally washing this with boiling water, and drying it at a temperature not exceeding 240°. The resin, when thus prepared, is nearly free from taste and smell. Its dose is from seven to fourteen grains. The scammony mixture is made with seven grains of this resin, triturated with three fluidounces of unskimmed milk. The resulting emulsion is uniform, and not distinguishable from milk by its colour, taste, or smell.

**FERRI CARBONAS SACCHARATUM.** *Saccharine Carbonate of Iron.* This is the carbonate of the protoxide of iron, protected from oxidation by saccharine matter, on the principle of Klauer and Vallet. The carbonate is obtained in the usual

manner, by double decomposition between the sulphate of iron and carbonate of soda. The precipitate is immediately washed with cold water, and freed, by squeezing, from as much of the water as possible. The pulp that remains is triturated, without delay, with white sugar, previously in fine powder. The mixture is then dried at a temperature not much above  $120^{\circ}$ . This saccharine carbonate is employed to make a new officinal pill of the Ed. Pharmacopœia, consisting of four parts of the carbonate, and one of conserve of red roses. It is called *Pilulae ferri carbonatis*, the name given to Vallet's ferruginous mass in the U. S. Pharmacopœia of 1842.

**FERRI IODIDI SYRUPUS.** *Syrup of Iodide of Iron.* This preparation, as we have already stated, is substituted in the second edition of the revised Edinburgh Pharmacopœia for the aqueous solution of the first, which has been abandoned. Soon after the protective power of saccharine matter against the full oxidation of iron was noticed by Klauer and Vallet in the case of the carbonate, several experimenters were induced to try its effects in other cases, where the prevention of oxidation was desirable. Dr. Christison states in his Dispensatory, that M. Frederking, of Riga, tried the influence of sugar on a recent solution of iodide of iron, and found that it rendered it permanent; and, applying the observation, Dr. Thomson, of the University of London, published in the Pharmaceutic Transactions, a formula for a *syrup of iodide of iron*, which, slightly modified, is that adopted in the last edition of the Ed. Pharmacopœia. Shortly after the promulgation of Vallet's formula in this country, Mr. William Procter, Jr., of this city, applied honey to the protection of the tincture of protochloride of iron, (see vol. x, p. 272, January, 1839, of this journal); and afterwards in a paper which appeared in the twelfth volume, (April, 1840,) he made known his equally successful results for the preservation of the solution of iodide of iron by means of several saccharine substances. The formula which he gave in the latter paper was substantially adopted by the revising Committee of the

U.S. Pharmacopœia; and the preparation was introduced under the name of *Liquor Ferri Iodidi*, honey being the protecting substance selected. Thus, then, the *syrup* and *solution*, severally, of the two Pharmacopœias are equivalent preparations, rendered unchangeable, the one by sugar, the other by honey, and devised in distant countries as the result of independent researches.

**LINIMENTUM AMMONIÆ COMPOSITUM.** *Compound Liniment of Ammonia.* This is evidently an imitation of Dr. Granville's counter-irritant lotion. The College have very improperly ordered it of two different strengths; because they allege it may be required weaker for some purposes. We object to this, as giving two different preparations the same name. Either the weakening of the stronger liniment must be left to extemporaneous prescription, or, if two strengths must be adopted, two names should be adopted also. Preparations are inserted in a Pharmacopœia to be prescribed by a given name, not as examples of prescriptions to be copied in detail.

**MISTURA CREASOTI.** *Creasote Mixture.* This is made by dissolving sixteen minims of creasote, by the aid of an equal quantity of acetic acid, in fourteen fluidounces of water, one of compound spirit of juniper, and one of syrup. It should have been left to extemporaneous prescription.

**PLUMBI NITRAS.** *Nitrate of Lead.* This is introduced for the purpose of preparing the *iodide of lead*, which is used to form an ointment by the London, but not the Edinburgh College. The London College forms the iodide by means of the acetate of lead.

**PULVIS RHEI COMPOSITUS.** *Compound Rhubarb Powder.* This consists of a pound of magnesia, two ounces of powdered ginger, and four of powdered rhubarb, mixed together.

**UNGUENTUM COCCULI.** *Cocculus Indicus Ointment.* The formula for this ointment is as follows:—"Take any convenient quantity of *Cocculus Indicus*, separate and preserve the kernels, beat them well in a mortar, first alone, and then

with a little axunge; and then add axunge till it amounts altogether to five times the weight of the kernels." This ointment is said to be one of the best applications for ring-worm of the scalp.

The list we have given of the additions to the Ed. Pharmacopœia shows a goodly number of new pills. These are generally useful combinations; but the majority of them should have been left to extemporaneous prescription. Where substances are combined in various proportions by the best practitioners, it is hardly necessary to make one proportion official. In the second revised edition, all the ingredients of pills are given in parts by weight instead of fixed weights, a change which facilitates the operations of the apothecary. The weight of the pills into which the mass is to be divided, is generally indicated in the formula, but sometimes left to the discretion of the prescriber. The formulas for tinctures are also considerably altered in this edition. In both editions the improvement of making many of them by the method of displacement is adopted, though the alternative of the old method is given. This improvement is also adopted in the U.S. Pharmacopœia of 1842.

The new Ed. Pharmacopœia presents the improvement of short notes to many of the substances, included both in the *Materia Medica* and the preparations, detailing their qualities when genuine, and the tests by which they may be known to be so. This plan was adopted in 1836 by the London College, at the suggestion, as it appears, of the Edinburgh College, but is carried out more fully by the latter body. This good example has been followed in the U. S. Pharmacopœia of 1842. The notes of the Edinburgh College are generally satisfactory. They are all embraced within the pages of the *Materia Medica* list; so that when a "preparation" has a note, its name is inserted in this list with its note appended. This causes what is called the *Materia Medica* list to contain more than it professes to embrace, and leads to a needless repetition of official names. The arrangement would have been better if the notes to the

preparations had been appended to their several formulas, but distinguished by a smaller type.

Though we have had occasion to object to the plan and execution of the new Edinburgh Pharmacopœia in many particulars, yet we are ready to admit its great superiority over its predecessor. Its English dress, the notes, the introduction of the method of displacement, are all important improvements. The nomenclature, faulty as it is, is an improvement on that of the previous Pharmacopœia.

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ART. XXXI.—OBSERVATIONS ON THE VOLATILE OIL OF  
GAULTHERIA PROCUMBENS, PROVING IT TO BE A  
HYDRACID ANALOGOUS TO SALICULOUS ACID.

By WILLIAM PROCTER, JR.

SEVERAL years since the volatile oil of *Spiræa ulmaria*, (meadow sweet,) first obtained by Pagenstecher by distilling the flowers of that plant with water, was proved by Löwig to contain a hydracid, which possesses uncommon interest from the number of compounds it is capable of forming with other bodies. The discovery of hyduret of salicyl as a product of the decomposition of salicin, by Piria, and its identity with the hydracid in oil of *Spiræa ulmaria*, as since demonstrated by the exact analyses of Ettling,\* have added much more interest to these proximate principles.

The hypothetical radical called *spiroil* by Löwig, and *salicyl* by Piria, Liebig denominates *salicule*. This radical, combined with an equivalent of hydrogen, forms *saliculous acid*, which, united with bases, constitutes *saliculites*. When saliculous acid is oxidized by the agency of potassa, water, and heat, *saliculinic acid* is formed, and its compounds are called *saliculates*. When saliculous acid combines with chlorine, bromine, or iodine, an equivalent of hydrogen is replaced by an equivalent of those elements respectively, and *chlorosaliculinic*, *bromosaliculinic*, and *iodosaliculinic* acids are produced.

For several years past it has been supposed† that the volatile oil of the *Gaultheria procumbens*, either from the analogy of their odor or specific gravity, possessed similar properties with the oil of *Spiræa ulmaria*, without any steps having been taken to ascertain the correctness of the supposition. The

\* Liebig's Turner.

† Dr. Wood, U. S. Dispensatory.

observations which follow are intended to throw light on this subject. The chemical characteristics of oil of gaultheria have been found, in many instances, to accord with those described as peculiar to saliculous acid, yet several instances occur to the contrary. They have the same density, and the aqueous solution of each colors the persalts of iron purple. The compounds which potassa, soda, and oxide of copper form with oil of gaultheria, are very like the salts of saliculous acid with those bases.

The action of an excess of caustic potassa with heat produces a crystalline body, identical in all its reactions with saliculous acid, as described by Piria.

The compound of oil of gaultheria and potassa, when exposed to the combined influence of moisture and the atmosphere, undergoes a decomposition similar to that of saliculate of potassa.

The reactions of chlorine and bromine with oil of gaultheria yield compounds similar to those with saliculous acid; and nitric acid also produces results of an analogous character.

On the contrary, the boiling point of oil of gaultheria is many degrees higher than that of saliculous acid. Ammonia forms a compound with it which differs from saliculate of ammonia in not being decomposed by acids with the separation of the oil, nor by potassa with the separation of ammonia. All endeavors to form the body called *saliculimid* by Liebig, with the process he gives, were ineffectual. The compounds of baryta and lead with oil of gaultheria are *white*, while the saliculates of those bases are yellow. But the most striking difference between these substances is, that when oil of gaultheria is boiled with solution of potassa, it is not recoverable by means of an acid, as saliculous acid is. Under these circumstances a crystalline substance is precipitated, which is the same acid that results from heating the oil with an excess of potassa.

*Oil of Gaultheria Procumbens.*—This volatile oil is ex-

tensively used by the pharmacutists of this country to flavor syrups, etc. Most of the oil used in this city is obtained from distillers residing in New Jersey, in which State the plant yielding it grows in great abundance. As usually found in the shops, it has a more or less intense red color, but when recently distilled it is colorless, or nearly so. Its density, as the result of several careful observations, is 1.173, and its boiling point  $412^{\circ}$ , Fahr.; the mercury remaining stationary at that point. Its taste is burning and aromatic; it is slightly soluble in water, to which it communicates its odor and taste; and it mixes with alcohol and ether in all proportions.

An aqueous solution of the oil is colored purple by the persalts of iron.

Dropped into a concentrated solution of potassa or soda, the oil is instantly solidified, becomes white, and separates from the alkaline solution while heat is disengaged.

Oil of gaultheria decomposes the carbonates of potassa and soda gradually without heat; but if gently warmed, the evolution of carbonic acid is evident.

Chlorine and bromine, when brought into contact with oil of gaultheria, combine with it; the mixture becomes very hot, and hydrochloric and hydrobromic acids are evolved. Iodine is dissolved by the oil forming a deep red solution, without combining with it, as heat dissipates the iodine without the production of any hydriodic acid.

Nitric acid of density 1.40, assisted by heat, converts oil of gaultheria into a crystalline substance having acid properties, whilst nitrous acid fumes are evolved. If fuming nitric acid be employed, the reaction is violent, without the assistance of heat, and a different product is obtained.

When oil of gaultheria is added to concentrated sulphuric acid the latter becomes slightly colored, and if heated, the odor of the oil is destroyed.

When oil of gaultheria is distilled with solution of potassa in excess, the distilled liquid has neither the odor nor taste of the oil, and consequently its constitution differs from that of the oil of *Spiræa ulmaria*, which, under the same circum-

stances, yields a volatile oil distinct from saliculous acid, that acid remaining combined with the potassa.

*Oil of Gaultheria and Ammonia.*—When oil of gaultheria is mixed with a concentrated solution of ammonia and agitated, it is gradually dissolved, and the solution acquires a brownish color. This solution, on being exposed to the air, deposits large brown colored crystals, as the excess of ammonia evaporates. When these crystals are dissolved in boiling alcohol, the solution suffered to cool, and the crystals thus obtained again dissolved and crystallized, the compound is obtained in four-sided prisms, with dihedral terminations.

This substance is slightly soluble in cold water, and more so in boiling water, which deposits it in tufts on cooling. Alcohol and ether dissolve it readily, but in solution of ammonia it is more soluble than in any other menstruum; from which it is precipitated by saturating the alkali with an acid. Solution of potassa dissolves it without separating ammonia, even when boiled. Sulphuric, nitric and hydrochloric acids have no effect on it when cold; hot sulphuric and hydrochloric acids dissolve it without decomposition, and when diluted the compound is precipitated; but hot nitric acid decomposes it, nitrous acid vapors being evolved. When heated to  $265^{\circ}$  Fahr. it fuses; and a few degrees higher it sublimes without residue, and condenses in crystalline scales with iridescent reflection, perfectly white and transparent, and possessing the same properties as before sublimation. When suddenly heated it boils, and is rapidly converted into vapor, without any separation of ammonia. It has no taste, and if pure, no odor; but in the form as first obtained, it has a weak aromatic smell.

A portion of this compound was kept moist in a close vessel for three weeks, without the slightest evidence of change. Neither acids nor alkalis, nor any other means which have been tried, will cause the isolation of the oil of gaultheria or ammonia from this substance.

*Oil of Gaultheria and Potassa.*—When oil of gaultheria is added to a concentrated solution of potassa instant combination takes place, and a crystalline substance results, which separates from the solution. Pressure between bibulous paper separates most of the adhering alkali; and by solution in a small quantity of hot alcohol it is deposited in six-sided tables by cooling. These crystals are transparent, nearly colorless, and are very soluble in water, and soluble in alcohol and ether.

When dry, this salt is not affected by the air, but if moisture be present it becomes dark colored, and finally black. The acids decompose it, setting the oil at liberty. It is precipitated white by the salts of baryta, lead, and zinc; yellow by nitrate of mercury; gray by the nitrate of silver; and bluish gray by protosulphate of iron.

When an excess of oil of gaultheria is employed in crystallizing it from alcohol, the salt is obtained in acicular crystals, which decompose by solution in water—a portion of oil being liberated.

*Oil of Gaultheria and Soda.*—The reactions of these two substances are similar to those with potassa. The soda salt is perfectly white, crystallizes in minute prisms, and is much less soluble in water and alcohol than the preceding salt.

*Oil of Gaultheria with Baryta.*—When chloride of barium is added to a solution of either of the two last salts, a white flocculent precipitate results. If to a transparent solution of baryta in cold water, oil of gaultheria be added, and the mixture agitated, a white flocculent precipitate is also obtained. This, when washed with alcohol and dried, is the salt of baryta. When it is mixed with water acids decompose it—the oil being liberated. It is soluble in boiling water.

*Decomposition of the alkaline salts of oil of Gaultheria by heat.*—If protosulphate of iron be added to a cold solution

of either the potassa or soda salts of oil of gaultheria, a bluish gray precipitate is produced; but when the solution is boiled for some time and then tested, no precipitate ensues on the addition of the ferruginous salt, but a deep red transparent solution results. By boiling a hot solution of the baryta salt the same decomposition occurs. When an acid is added to either of the boiled solutions, a white crystalline precipitate is obtained, without a trace of the oil of gaultheria. This crystalline matter, when heated in a close vessel, sublimes without residue, and condenses in four-sided prisms, with obliquely truncated summits. When dissolved in hot water its solution yields the fine purple color with protosulphate of iron, so characteristic of the *acid* obtained by acting on oil of gaultheria with an excess of potassa and heat, as shown in the sequel, which has all the characters of salicylic acid.

*Oil of Gaultheria and Oxide of Lead.*—When an excess of this oil is agitated for some time with hydrated oxide of lead suspended in water, combination takes place. By subsequently washing with alcohol, the compound is obtained free from adhering oil. It may also be obtained by adding acetate of lead to a solution of the potassa salt of oil of gaultheria. It is a light white powder. When mixed with water and an acid is added, the oil separates, and floats on the surface of the liquid in minute globules.

*Oil of Gaultheria and Oxide of Copper.*—When hydrated oxide of copper is agitated with an aqueous solution of oil of gaultheria, the mixture, from a blue, is changed to a grass green color, and the odor of the oil ceases to be perceptible. An excess of oil should be present to combine with all the oxide, and the precipitate washed with alcohol and dried. This compound has the form of a light green powder. When heated it is decomposed, and if suspended in water, the contact of an acid causes the oil to separate.

*Oil of Gaultheria and Oxygen.*—When oil of gaultheria is heated with an excess of potassa, the same reaction occurs as when saliculous acid is treated in the same way; a gaseous matter (hydrogen) is evolved, and the whole becomes a crystalline mass on cooling, without a trace of the oil being perceptible. By dissolving this mass in water, and adding an excess of diluted hydrochloric acid, a white precipitate results, which consists of tufts of crystals resembling benzoic acid. By washing with cold, and dissolving in boiling water, the solution, on cooling, yields beautiful silky four-sided prisms, with obliquely truncated summits.

This substance possesses the properties of an acid; it is slightly soluble in cold water, to which it communicates an acid reaction, and much more soluble in boiling water, alcohol and ether. It fuses at 250° Fahr., and when further heated sublimes unchanged, condensing in long, very brilliant, four-sided needles, more regular than those obtained from water. The vapor of this acid excites coughing when inhaled; its taste is sweetish, like that of acetate of lead, and it irritates the fauces on swallowing. It decomposes the alkaline carbonates with effervescence, and forms with the salts of iron a fine purple solution. Nitric acid, sp. gr. 1.40, when cold, does not effect it; but if heat be applied, red fumes are evolved, and a yellow crystalline matter produced. Fuming nitric acid acts on this acid when cold.

When this acid is saturated with potassa, a white salt is obtained in feathery crystals, which is soluble in water, alcohol and ether. It is precipitated by the soluble salts of lead and tin; but those of baryta, zinc, copper, magnesia and iron, do not. The salt of soda is similar to that of potassa.

The ammoniacal salt crystallizes in needles. When heated to 260° Fahr., it fuses and sublimes in brilliant scales, having an iridescent reflection. Too much heat partially decomposes the salt, leaving a carbonaceous residue. It is soluble in water, and potassa added to its solution separates ammonia.

When protosulphate of iron is added to a solution of either

of the above salts, a deep red color is produced. When the persulphate is employed, the solution is purple.

If to a boiling solution of this acid an excess of carbonate of lead be added, carbonic acid is liberated, and on filtering the hot solution, beautiful four-sided crystals of the lead salt are obtained.

With nitrate of silver the soluble salts of this acid yield a white precipitate.

*Oil of Gaultheria and Chlorine.*—When a current of chlorine is passed through oil of gaultheria it is rapidly absorbed, hydrochloric acid is evolved, the oil assumes a yellow color, and becomes very hot. If the chlorine is continued until the evolution of the hydrochloric acid ceases, the temperature of the oil decreases, and it becomes a crystalline mass. By dissolving this in boiling absolute alcohol, the compound is obtained on cooling, in transparent rhomboidal plates, slightly tinged with yellow. This substance is insoluble in water, but soluble in alcohol, ether, and solutions of the fixed alkalies. When the crystals are dropped into a concentrated solution of potassa they turn red, and on the application of heat are dissolved, forming a deep red solution. By adding an acid to this solution the compound is precipitated unchanged. When heated, it fuses at a temperature of 220° Fahr. into a colorless liquid, which readily crystallizes on cooling.

When heated in close vessels, it sublimes at a few degrees above its fusing point, and condenses in colorless rhomboidal crystals. Its vapor burns with a flame edged with green. Sulphuric acid dissolves it, from which it is precipitated by water. Its taste is peppery, and its odor peculiar. When the solution of this chlorine compound in potassa is evaporated, the salt is obtained in reddish colored crystals.

The solution of this compound of oil of gaultheria with chlorine, in potassa, without decomposition, together with its other characteristics, renders its identity with chlorosaliculinic acid strongly probable.

*Oil of Gaultheria and Bromine.*—If an excess of bromine is added to oil of gaultheria, the mixture instantly becomes hot, and hydrobromic acid is evolved. When all the oil has combined, the whole becomes a crystalline mass. By the application of a gentle heat the excess of bromine and hydrobromic acid are driven off, and on cooling, the compound is obtained perfectly pure. Its solution in hot alcohol, on cooling, yields tufts of acicular crystals. It fuses at  $140^{\circ}$ , and commences subliming at  $150^{\circ}$  Fahr.; but does not recrystallize for some time after cooling. When heated in close vessels, its vapor condenses in minute drops, which become crystalline by standing. Its taste and odor are peculiar, and differ from the chlorine compound. Its solution in potassa is light yellow, from which it is precipitated perfectly white by an acid.

*Oil of Gaultheria and Iodine.*—Oil of gaultheria dissolves iodine readily, but does not combine directly with it, as the solution may be heated without the production of hydriodic acid. When, however, either of the preceding compounds is mixed intimately with iodide of potassium, the mixture acquires a brownish color; and when heated very gradually a red vapor arises, and condenses in a crystalline form on the sides of the tube. This substance is insoluble in water, soluble in alcohol and ether, and fuses readily.

*Oil of Gaultheria and Cyanogen.*—When either the chlorine or bromine compound of oil of gaultheria is intimately mixed with cyanuret of potassium or mercury, and heated in a tube, a white vapor rises, and condenses in the form of a yellow oil, which, by standing, becomes crystalline. Its odor is very peculiar; it crystallizes in needles, and is soluble in alcohol and ether.

*Action of Ammonia on the compound of Chlorine and Oil of Gaultheria.*—A portion of the chlorine compound, which had been fused several times to entirely deprive it of

any hydrochloric acid, was placed in a long tube, and a current of dry ammonia passed over it for some time. The ammonia changed the color from white to light gray, and no moisture was condensed in the tube. When washed in water, this substance communicates a yellowish color to that fluid; on adding nitrate of silver a white precipitate is produced, which is soluble in ammonia. After being dried it was dissolved in hot alcohol, and was obtained in crystalline plates of a light yellow color by cooling. These were soluble in a hot solution of potassa, without the separation of ammonia, forming a yellow solution, from which a white precipitate is thrown down by an acid. This substance does not appear to have the characters of *chlorosaliculimide*.

*Action of Nitric Acid on Oil of Gaultheria.*—When oil of gaultheria is added to nitric acid, sp. gr. 1.40, no immediate action results; but if gently heated, copious fumes of nitrous acid are evolved, and the oil is converted into a yellow crystalline substance. By washing with water, and dissolving it in boiling alcohol, it is obtained in silky crystals, which have a pale yellow color, and acid properties. It is slightly soluble in water, to which, however, it communicates a yellow color; but alcohol and ether dissolve it more readily. When heated to 200° Fahr., the crystals fuse into a yellow liquid; more heat causes a partial sublimation, leaving a residue of charcoal. It changes litmus to yellow, without a trace of red; its solution colors the skin and nails deep yellow, and has little taste, but causes an irritation of the throat, which excites coughing.

This acid combines with potassa to form a deep yellow crystalline salt. Its ammonia salt crystallizes in bright yellow needles, which, when heated, fuses, and then sublimes in small yellow crystals unchanged. It does not detonate when heated, like the other salts of this acid.

A solution of either of these salts is precipitated yellow by acetate of lead, green by sulphate of copper, and yellow by nitrate of mercury. Sulphate of zinc and nitrate of silver

are not changed. The addition of a strong acid decomposes these salts; their acid being precipitated in a crystalline form.

When the salts of potassa or lead are suddenly heated they fulminate, and leave a black carbonaceous residue. This feature characterises the salts of nitrosaliculic acid.

When oil of gaultheria is dropped into fuming nitric acid, a violent reaction takes place; the mixture becomes very hot, and much nitrous acid is given off. A deep orange colored substance is formed, with a resinous aspect, which is deposited in yellow scales, from its hot alcoholic solution by cooling. This substance has a very bitter disagreeable taste, and a peculiar odor. It dissolves in potassa, forming a yellow solution, but is not precipitated when the alkali is saturated with an acid.

In conclusion it may be observed, that the foregoing observations prove that the oil of Gaultheria procumbens is a hydracid, forming salts with bases, and compounds with chlorine, bromine, and iodine, like saliculous acid; but, at the same time, it exhibits differences in its reactions which render the identity of the two substances improbable. The only means of settling this question definitely is, to subject the oil and its compounds, to rigid ultimate analysis, which the want of accurate instruments has caused the author to defer to a future period.

ART. XXXII.—THE FERRUGINOUS WINES, AND SOME  
NOTICE OF THE MORE RECENT MARTIAL PREPARA-  
TIONS.

By AUGUSTINE DUHAMEL.

OF the wines of a chalybeate character, whether prepared from pure or oxidized iron, or combined with an organic acid, a variety may be found in the shops of the apothecary.

These will be found to differ in quality and strength, according to age, manner of preparation, and nature of the constituents. From the want of a fixed standard, they are prepared according to the judgment of the apothecary, and are selected agreeably to the caprice of the physician for whose individual practice they may be designed.

This great latitude must ensue where we have no official direction—which in this case is as much needed as with other preparations where pharmaceutic operations are guided by an authority we are pleased to recognise. One was originally given in the U. S. Pharmacopœia, 1st edition; but in the 2d and 3d editions the framers of the work thought proper to discard it, for what were deemed by them sufficient reasons, though its reintroduction was recommended by the pharmaceutic body.

The latter, in consideration of being obliged to prepare and keep it to meet the demands of such practitioners as incline favourably towards its tonic powers as a medicine, believe it should constitute one of the *Preparata* of the Pharmacopœia.

The rejection of a formula for a preparation not altogether obsolete, from the apothecary's guide-book, would seem to indicate that it becomes his duty to banish said preparation from his shop. It is unreasonable to suppose that this will be done, so long as there exists a demand for it.

The reason assigned for its rejection was its inequality of

strength. As the quantity of iron dissolved is in proportion to the acid contained in the wine, and as it is difficult to obtain, at all times, a wine identical in its constituents, the chalybeates resulting from them must of course be possessed of different degrees of tonic effect.

Though of an inconstant character, there is a certain degree of confidence attached to their use, from the knowledge that they are not of a class to expose a patient to imminent danger in taking increased doses.

Under existing circumstances, it is desirable that physicians, in prescribing *Vinum Ferri*, would specify the formula they intend, in order to determine the quantity of active ingredient.

To a physician who would properly appreciate the medicinal value of these martial preparations, it is requisite to observe not only the composition of each formula, but also the chemical action resulting from the ingredients in contact with the wine.

The wines of the compounds of iron are not so liable to this objection. The later discovered combinations with citric acid are used to a considerable extent.

As the American Journal of Pharmacy presents the best medium of information to our apothecaries upon the subject of *formule*, when not given in the National Pharmacopœia, and supplies the place of a Vade Mecum, or Apothecaries' Manual, I have collated for the use of its readers, from the principal Pharmacopœias, a few formulas appertaining to the Wines of Iron, which, it is hoped, may prove useful as a reference.

First in order is the old formula of the U. S. and Dublin Pharmacopœias.

“Take of

Iron Wire, cut in pieces,

4 oz.

White Rhenish Wine,

4 pints.

Sprinkle the wire with some of the wine, and expose it to the air till covered with rust, then add the remainder of the

wine; macerate for ten days (digest for 7 days, Dub.) with occasional agitation, and filter."

A slight disengagement of hydrogen gas takes place during the maceration, resulting from the decomposition of the water by the iron, which becomes oxidized, and combines with the bitartrate of potash of the wine. As there is, likewise, a little acetic or malic acid contained in the wine, the efficacy of this chalybeate is based upon a mixture of acetate or malate of iron with ferro-tartrate of potash.

### *Vinum Ferri.*

Vin Martial ou Chalibé.—(Codex.)

Pure Iron Filings,	1 oz. or 32 parts.
White Wine, (genereux,)	2 lbs.=1000 "

Macerate in a matrass for six days, stirring from time to time, then decant and filter.

This, as will be perceived, differs from the first mentioned formula in being prepared with only half the quantity of iron.

Other Pharmacopœias of Europe give the same process, differing only in a more or less prolonged maceration, except the London Pharmacopœia, which cannot with any propriety claim the name of a wine, being a spiritous solution of the double tartrates of iron and potassa with cream of tartar.

The wines of iron are subject to a change of color after long standing, becoming gradually blackened, consequent upon the action of the iron upon the astringent matter of the wine.

To obviate this, it has been recommended by Mr. Beral to shake the white wines with a little hydrated peroxide of iron, and after a few days a separation of the astringent matter ensues.

Wine of iron is much used in France as a domestic remedy in families, who prepare it for their own use by suspending a *boule de mars* (an impure tartrate of iron and potash made into a paste with a concentrated decoction of vulnerary herbs,

and formed into boluses weighing one or two ounces when dried,) from the neck of a wide mouthed decanter, in which is contained a quart of white wine.

When water is substituted for the wine, as is sometimes the case, it forms what is called *Eau de Boule*.

In addition to these simple wines are others, containing bitter and aromatic substances, to produce a stimulant tonic effect. The following, published in Ellis' Formulary, has been used to some extent in this country, and is similar to a formula much recommended by the late Dr. Physick, under the name of Aromatic Wine of Iron.

Iron Filings,	1½ oz.
Gentian,	½ oz.
Bitter Orange Peel,	½ oz.
Red Wine,	2 pints.

#### *Wine of Citrate of Iron.*

(From Guibourt's *Traité de Pharmacie*.)

Citrate of Iron, dry,	1 part.
Malaga Wine,	96 parts.

The preparations of citrate of iron, though little used here, have commended themselves to the notice of London and Paris practitioners.

*Citrate of Iron* is said to have been first introduced to the medical profession by Mr. Beral, of Paris.

As it is not likely to be procured in our shops at present, it is deemed perfectly in place to give the manner of preparing this salt.

Citric Acid, crystallized,	3 oz. or parts.
Hydrated Peroxide of Iron, dry,	2 " "
Distilled Water,	12 " "

(If the moist hydrate be used, about 6 oz. are required; but as the degree of moisture is not always the same, it is well to add that the peroxide must be in excess.)

Boil together in a matrass until the whole of the peroxide is dissolved. Filter, and wash the filter with sufficient distilled water to obtain twelve parts of liquid. This forms what is kept in France under the name of *Liquid Citrate of Iron*, marking 24° B., and holds in solution one-third of its weight of *dry citrate of Iron*.

The dry may be easily obtained by exposing the liquid in shallow vessels, containing but a thin stratum, and dried in a heated stove. When dry it separates in the form of thin scales, very brilliant, and of a beautiful golden red color. This salt dissolves very slowly in water, but in the end is completely dissolved.

It dissolves readily in boiling water.

The combining proportions of this substance are forty parts of the oxide of iron to seventy parts of crystallized citric acid. It has an acid, not unpleasant taste, and of all the ferruginous salts is the least disagreeable to be taken.

• Beral obtains his citrate by treating iron filings with citric acid, and exposing the product to the air to dry.

In the Hamburg Pharmacopœia is given a formula for a Citrated Aromatic Wine of Iron, as follows:

"Iron Filings,	1 oz.
Lemon Juice,	3 oz.

Let it macerate during a night, and add

Gentian,	½ oz.
Cinnamon,	2 drachms.
White Wine,	16 ounces.

Digest for twenty-four hours, then decant."

This, or an analogous preparation, as I have been told, is used by physicians in Charleston, S. C.

*"Wine of Acetate of Iron.*

(Traité de Pharmacie par Soubelran.)

Acetate of Iron, (dry,)	32 grs.
White Wine,	1 lb."

This is made from the acetate of the peroxide of iron, an extremely soluble salt.

To obtain it, you add to concentrated acetic acid *recently* precipitated hydrated peroxide of iron, until the latter ceases to dissolve any more; then add a slight excess of acid, to effect a perfect solution, and evaporate to dryness upon a water bath.

This combination takes place slowly. Some old hydrated peroxide, which I desired to convert into acetate, was very little, if at all, attacked by concentrated acetic acid.

Like most of the salts of iron the acetate is deliquescent, and requires to be kept in glass stopper bottles.

*"Wine of Hydriodate of Iron:*

De Dr. Piérquin;

Hydriodate of Iron, 4 drachma.

Bordeaux Wine, 1 lb.

A tablespoonful of this wine is given night and morning to adults."

The other chalybeates of the day, such as lactate and malate of iron, the double salts of ammonia and tartrate of iron, and ammonio-citrate of iron, have not yet, as far as I can ascertain, been essayed under cover of a vinous menstruum.

The ammoniacal citrate of iron may be prepared by adopting the method recommended for the ammonio-tartrate, vol. 6th, page 275, new series, of this Journal, merely substituting one acid for the other.

The lactate, from its little solubility, is not employed in a liquid state, but is made up into pills, tablettes, lozenges, and is incorporated with biscuits and chocolate.

It appears that the greater part of the lactate of iron used in France is obtained from the *lactate of lime*, an article of commerce, supplied from the residue proceeding from the manufacture of beet root sugar. According to Beral, to convert it into lactate of iron 500 grammes of lactate of lime are

dissolved in two kilogrammes of boiling water. The lime is precipitated by oxalic acid, and the filtered liquid containing the lactic acid, heated in contact with iron filings for six or eight hours, when, upon cooling the filtered liquors, the lactate of iron is furnished.

The malate of the protoxide of iron, official in the Pharm. Pruss. under the name of *Extractum Ferri Pomatum*, is prepared by digesting one part of iron nails, or wire, together with four parts of the juice of apples, for some days, then evaporating the liquid to one-half, filtering, and concentrating to the thickness of an extract.

The inconstant nature of the class of ferruginous wines has not escaped the observation of medical writers. A long time ago a Mr. Parmentier suggested the propriety of substituting a wine of more definite character, to be made from a certain proportion of liquid tartrate of iron and potash, holding in solution a fixed quantity of the salt.

Reference is made to a preparation of this kind in nearly all the French works treating of Pharmacy, under the name of "*Teinture de mars tartarisée*."

Virey directs one oz. of this tincture to be added to a pound of white wine.

A very valuable preparation of iron very little known here, though sometimes prescribed by foreign practitioners, is the *Bestucheff's Tincture*, much used and highly esteemed in Germany, and also in France, where it is sometimes known under the name of General Lamotte's Drops.

Its synonyms are—*Guttæ Vervinæ*, *Ethereal Tincture of Iron*, *Liquor Anodynus martialis*, *Elixir d'or*.

Proto-hydrochlorate of Iron, deliquescent, 1 part.

(Made by treating iron filings with sufficient hydrochloric acid to dissolve the metal, evaporating to dryness, and leaving the chloride, thus obtained, fall into deliquescence.)

Sulphuric Ether, 2 parts.

Shake the mixture well together in a bottle until the ether

assumes a golden yellow color, then decant this, and to it add—

Rectified Alcohol,	4 parts.
Mix.	

Another ethereal tincture of iron is made with the acetate as follows:

“To nine parts of concentrated vinegar, moist hydrated oxide of iron, well washed, is to be slowly added until a certain portion remains undissolved. To the filtered liquid one part of acetic ether and two parts of rectified spirit, having a specific gravity of 0.820, are to be put, in order to complete the tincture.—(*Pharm. Pruss.*)

These, so far mentioned, comprise the formulas taken from respectable authorities. There are an infinite variety of others, recommended by medical writers according to the particular notions they may have adopted from their own experience; but as they all derive their virtue from a similar basis, it is needless to detail their different associations, believing that a sufficient number of combinations have been given to determine a choice.

The preparations of iron, like many other remedies subject to the revolutions of Fashion, from a state of discredit into which they had been cast, are again restored to their wonted usefulness. They are now much in vogue; hence we see them recommended in the medical journals of the day under a multitude of forms, some of them entirely novel. Those combined with the organic acids are decidedly the most popular.

A supposed condition necessary to the success of martial preparations for medicinal use is, that the iron should be in a state of *protoxide*, or one easily convertible to it, that it may assimilate with, and become one of the elements of the blood, which, it is alleged, is not the case with the salts of the *peroxide*. The acid, combined with the protoxide, must, likewise, be either carbonic or an organic acid, easily

changed by the action of the gastric juice, such as the lactate of the protoxide of iron. The citrate, malate, tartrate, and acetate of the protoxide of iron, fulfil equally the same conditions.

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ART. XXXIII.—AN INAUGURAL DISSERTATION ON JUNIPERUS VIRGINIANA. By WM. J. JENKS.

(*Extract from an Inaugural Essay.*)

*Medical Properties.*

ALTHOUGH the leaves of this tree are generally considered inferior to those of Savine, there can be no doubt but that their preparations, if rightly administered, are capable of producing beneficial results. Their effects upon the animal economy are gently stimulant, emmenagogue, diuretic, and, under favorable circumstances, diaphoretic. As a diuretic it is said they have been advantageously used in dropsy, and as a diaphoretic in rheumatism.

"An ointment made by boiling the leaves for a short time in twice their weight of lard, with the addition of a little wax," is peculiarly efficacious as an application to blisters, maintaining a constant purulent discharge.

The essential oil, when given internally, acts as an emmenagogue; applied externally it is an irritant and rubefacient. It is requisite in the administration of it that great care should be taken, as dangerous consequences have accrued from the improper use of it.

*Chemical Investigation.*

Although the red-cedar is a native of our own country, and its evergreen branches are conspicuous throughout all

seasons, it does not appear to have elicited much attention from chemists. I have never seen any analysis of any part of it recorded. With a view, therefore, of ascertaining what are the chemical constituents of the leaves, I have been induced to perform a few experiments.

The leaves were gathered in the fall, when perfectly developed, and carefully separated from the twigs and all extraneous matter.

1. A decoction was made by boiling two ounces of the fresh leaves in a pint of water for fifteen minutes; when filtered, it was of a greenish-yellow color, and showed a slight acid reaction when dropped upon litmus paper.

To a portion of this decoction a few drops of the subacetate of lead in solution were added, when immediately a copious precipitate, of a dull white color, ensued; this precipitate was separated by filtration, and dried. It was readily soluble in nitric acid, which changed it to a dull red color, and formed a mucilage with water.

With other portions silicated potassa threw down a dull white precipitate, lime water a dark yellow, and alcohol a grayish one; thus proving the existence of *gum*.

Starch could not be detected in the decoction, by either the infusion of galls, or tincture of iodine.

2. To another portion of the decoction a small quantity of the tincture of muriate of iron was added; at first the liquid assumed a bluish color, but in a few minutes a dark brown substance precipitated. With another portion a solution of gelatin threw down a light yellow precipitate, showing the presence of *tannic acid*.

3. One ounce of the leaves was beaten in a mortar with six ounces of cold water, until the liquid assumed a pulpy consistence. When filtered it was of a light yellowish cast, and partook of but little of the taste or odor of the leaves. A portion of it yielded an ash-colored precipitate with a solution of corrosive sublimate. After the substance had ceased to precipitate, the liquid was well shaken and thrown upon a filter, on which the precipitate remained. When dry it was

put in a test glass, and a strong solution of carbonate of potassa poured upon it; this partially dissolved it, and changed its color brown; sulphuric acid was then added until effervescence ceased: when neutral, the solution was nearly transparent, but upon the addition of a slight excess of sulphuric acid, a precipitate was reproduced.

Another portion of the liquid was raised to the boiling point and set aside; while cooling, an ash-colored substance coagulated at the upper surface, but when it became cold, or of the same temperature of the room, which was about sixty degrees, it gradually precipitated in flaky masses. This precipitate was also soluble in a strong solution of carbonate of potassa, and was precipitated again by an excess of sulphuric acid, proving *vegetable albumen* a constituent.

4. An infusion was made by pouring a pint of boiling water upon two ounces of the fresh leaves, and macerating in a covered vessel for six hours. When filtered it was of a light greenish-yellow color, and partook of the taste of the leaves in a slight degree.

To a portion of this infusion a small quantity of a solution of nitrate of silver was added, when, upon standing, a copious precipitate of a dark brown color ensued. A solution of protochloride of tin also produced a flocculent precipitate, denoting *bitter extractive*.

5. A tincture was prepared by macerating half an ounce of the leaves in four ounces of absolute alcohol for a week. At the end of this time it assumed a bright green color, and partook strongly of the taste of the leaves. Upon the addition of water it instantly assumed a milky appearance, and in the course of half an hour a greenish substance was precipitated; this was collected upon a filter and dried; when heated, it melted, and disengaged fumes, which possessed but little, if any, of the odor of the leaves.

An extract prepared from this tincture was translucent, resinous, and of a bright green color; this also disengaged fumes when heated, leaving a brown powder, which was changed to green by the addition of aqua ammonia. This

extract was undoubtedly composed of *resin* and *chlorophylle*.

6. An attempt was made to isolate chlorophylle by the process recommended by Dr. Turner, in his work upon Chemistry, 5 Am. edit., p. 573. The leaves were beaten to a pulpy consistence with water, the liquid strained, and to it was added an equal quantity of alcohol; after standing about two hours the alcohol was driven off by heat, but nothing was observed floating upon the surface of the remaining liquid. The experiment was then varied several times, but nothing satisfactory was the result.

7. Six ounces of the leaves were placed in a tubelated retort and covered with water, in which a small quantity of chloride of sodium was dissolved; a receiver was adapted and heat applied. During the distillation the liquid in the retort assumed a milky appearance, but that in the recipient was colourless, and possessed the taste and odor of the leaves in a high degree. The distillation was carried on for near an hour, when about two pints had been condensed in the receiver: this liquid was placed in a precipitating jar and set aside. Upon standing twenty-four hours there arose to the surface a small quantity of oil, which was carefully removed; it possessed the strong odor of the leaves, and a warm, pungent taste. When nitric acid was added to a portion of it fumes were disengaged, which were disagreeable, and did not possess any of the odor of the leaves. The remainder, when dropped upon paper, gave it a semitransparent appearance; and when the paper was exposed to the action of heat, the oil was volatilized, and the paper left unstained.

8. An ethereal tincture was prepared by macerating an ounce of the leaves in eight ounces of sulphuric ether for ten days, when it was of a lively green color. This was filtered, and placed aside for spontaneous evaporation, which required about two weeks. There remained in the vessel about half a drachm of a greenish colored oil, about the consistence of thin syrup; it was unctuous to the touch, and when dropped upon paper left a permanent greasy stain. By the addition

of a saturated solution of carbonate of soda it was converted into a soapy substance, and changed to brown. A saturated solution of carbonate of potassa acted upon it in a similar manner. Aqua ammonia caused a brown color, but no appreciable change in the consistence.

9. One thousand grains of the leaves were incinerated in a crucible exposed to the atmosphere; but twenty-five grains of ashes were obtained, which were of a light gray color, possessing an alkaline taste; these were lixiviated with four ounces of water, with occasional agitation, for two days, at a temperature of about seventy-five degrees. The ley was then filtered; it had a sweetish alkaline taste, and a feint odor, peculiar to ordinary ley; it changed turmeric paper brown, but produced no acid reaction upon litmus. A solution of chloride of platinum was added to a portion; the liquid instantly assumed a bright yellow color, but remained transparent two weeks afterwards. Tartaric acid in solution was then added to another portion, and the liquid stirred with a glass rod, but no precipitate took place upon standing. Nitric acid was then added to a third portion, until the liquid was neutralized, and the solution evaporated to dryness; a white salt was obtained, which was deliquescent. It did not deflagrate to any extent when thrown upon fire, or exhibit any of the properties of nitrate of potassa;\* but when dissolved in water

\* Subsequent experiments have satisfactorily proved the existence of potassa, though in a very minute proportion. Upon evaporating the yellow colored liquid, formed by the addition of chloride of platinum, to dryness, a yellowish salt was obtained, which, when dissolved in a small quantity of cold water, was deposited in the form of small brilliant yellow crystals, the chloride of platinum and potassium.

But a more satisfactory result was obtained by treating the ley with an alcoholic solution of carbazotic acid. A few grains of carbazotic acid were dissolved in about half a dram of alcohol, and the solution added to half an ounce of the ley. Upon standing twelve hours, a number of bright yellow crystals of carbazotate of potassa, of an acicular form, were found at the bottom of the vessel, diverging in every direction. They were near a quarter of an inch in length, about the thickness of a hair, and ended in a very delicate point. When heated to redness in a platinum capsule they detonated, and gave off beautiful brilliant scintillations.

a few drops of the solution of oxalate of ammonia occasioned a dense white precipitate. Also, when oxalate of ammonia was added to the ley, immediately a dense white precipitate followed. A stream of carbonic acid also occasioned a whitish precipitate when passed through the ley, showing the presence of *lime* in large quantity, and in a free state.

To prove that the above formed precipitate was not a salt of magnesia or soda, sulphuric acid was added to another portion of the ley, when immediately a dense white precipitate was thrown down, which must have been sulphate of lime, since the sulphates of magnesia and soda are both soluble in water.

Ferrocyanuret of potassium produced no appreciable change in appearance when added to the ley, or the decoction made with water acidulated with hydrochloric acid.

10. Two ounces of the leaves were macerated in alcohol for a week, when the whole was thrown into a displacement filter, and the liquid displaced with alcohol until it passed through colourless. The leaves were then boiled in three successive portions of water, and finally with water acidulated with hydrochloric acid. When perfectly dry they weighed nine drachms, showing about fifty-six per cent. of *lignin*. They were tasteless and inodorous, broke with a short fracture, and were readily decomposed with sulphuric acid, forming with it a black viscid mass.

A number of other experiments were performed, but as nothing new was elicited, it was deemed inexpedient to record them.

From the foregoing experiments it is reasonable to conclude, that the following substances are the constituents of the leaves of the *Juniperus Virginiana*, viz ; Gum, Tannic Acid, Vegetable Albumen, Bitter Extractive, Resin, Chlorophylle, Volatile Oil, Fixed Oil, Lime in a free state, and Lignin.

ART. XXXIV.—ON SOME INCONVENIENCES WHICH MAY  
OCCUR FROM THE USE OF THE SULPHURIC ACID OF  
SAXONY, OR OF NORDHAUSEN, AS A REAGENT.

By M. A. DUPASQUIER.

IN testing for minute traces of iodine in any liquid, sulphuric acid affords the most sensible results by its addition to the liquid, with which a small quantity of a solution of starch has been previously mixed; at least this is the result of comparative trials which I have made, and which have demonstrated that, to set free the iodine, sulphuric acid is preferable to the use of chlorine, the chlorides of the oxides, aqua regia, the voltaic pile, &c.

Since making these experiments, chance has informed me that it is not a matter of indifference, in the detection of iodine, what kind of sulphuric acid is used, and for the following reason: In one of my latter lessons at the School of Medicine I wished to demonstrate the sensibility of this reagent, and was surprised at not obtaining the violet blue color as I expected. At the moment when I poured the acid into the liquid a faint violet tint was produced, but immediately disappeared.

On investigating the cause of this unexpected result, I learnt that my assistant, not having the ordinary acid, had given me a bottle of that of Nordhausen. From this explanation I immediately concluded, that the non-coloration of the starch was due to the *sulphurous acid*, which is commonly present in sulphuric acid, obtained by the distillation of sulphate of iron. In fact, we know that free iodine, in contact with a solution of sulphurous acid or a sulphite, immediately disappears, passing to the state of hydriodic acid. The following experiments have rendered certain this explanation of the non-coloration of starch.

1. I poured ordinary sulphuric acid into a glass of water

to which one drop of a solution of iodide of potassium and some solution of starch had been previously added; the liquid immediately assumed a violet blue color.

2. The same experiment was repeated, some drops of a solution of sulphurous acid being added before the sulphuric; the color was not manifested, even on the addition of a large excess of this latter acid.

3. The same experiment repeated, some drops of a solution of sulphite of soda being substituted for the sulphurous acid, and with the same result; the liquid remained uncolored.

4. The same experiment with a large proportion of iodide of potassium; the same result, only at the moment when the sulphuric acid was added, faint traces of violet appeared, but immediately faded away.

From these experiments we must conclude, that the presence of sulphurous acid in the sulphuric acid of Nordhausen, is the true cause of the non-coloration of the starch, when this acid is used to detect the presence of an iodide in a liquid.

This influence of sulphurous acid on iodine gives a satisfactory explanation of the following fact, which is analogous to that just pointed out.

In my chemical experiments, made during five or six years, on the employment of protiodide of iron, I have taken care to direct that the urine of the patient should be preserved, to ascertain, by a chemical test, whether this remedy had been really taken. The test consisted in diluting the urine with an equal bulk of water, then adding a little solution of starch, and finally some sulphuric acid. The liquid immediately assumes a blue color, whenever the patient had taken the iodide of iron, a short time before voiding the urine. The addition of water is indispensable; for the color is not manifested, or is hardly sensible, when the urine is very much charged with, or is not rendered more clear, or less abundant in organic matter, by means of this liquid. Is it not evident that the non-coloration of the amidon, under this circumstance, of a highly charged urine, is due to the formation

of a small quantity of sulphurous acid, from the reaction of strong sulphuric acid on the animal matter? The addition of water causes a decrease of action of the acid on the organic substances contained in the urine.

The presence of sulphurous acid in the sulphuric acid of Nordhausen should equally cause its rejection when operating with Marsh's apparatus, since MM. Fordos and Gelis have demonstrated that sulphurous acid is, under these circumstances, converted into hydrosulphuric acid, which precipitates the arsenic as sulphuret, and diminishes, although it does not completely prevent, the production of the arsenical spots. We, however, know that the Nordhausen acid is recommended in preference for this purpose, because it never contains arsenic.

In conclusion: *the sulphuric acid of Nordhausen or Saxony, used as a reagent in place of the ordinary acid, may become, in many chemical researches, a cause of serious error. This inconvenience results from this acid usually containing sulphurous acid.*

*Journ. de Pharm. and de Chim.*

## ART. XXXV.—ON THE MINUTE DIVISION OF MERCURY.

By JACOB BELL.

THE effect produced on mercury by trituration with other substances has been for many years a subject of dispute, and it is at this time so undetermined that we can scarcely find any two authorities which coincide. The explanations which are given are so hypothetical and indefinite, and the experiments on which they are founded so liable to fallacy, that a further examination of the properties of mercury, when thus triturated, is desirable.

The Pharmaceutical Chemist is particularly interested in this question; for until he has determined to what extent the efficacy of mercury is dependent on oxidation, and in what manner the required change in the metal may with certainty be effected, he cannot ensure an absolutely uniform result in the following preparations—Hydrarg. cum Cretâ—Pil. Hydrarg.—Ungent. Hydrarg., &c.

Quincy asserts in his new Dispensatory, A. D. 1753,

“Notwithstanding the mildness and inactivity of crude quicksilver undivided, when resolved by fire into the form of a fume, or otherwise divided into very minute particles, and prevented from reuniting by the interposition of proper substances, or combined with mineral acids, it has very powerful effects; affording the most violent poisons and the most excellent remedies that we are acquainted with.”

This sentence contains nearly as much practical information as is comprised in the following quotations from modern authorities:—

HYDRARG. CUM CRETA. (*Powell's Pharmacopœia*, 1815.)—“It appears to be very slightly oxidized by the trituration, as it contains, according to Fourcroy, only .04 of oxygen.”

(*Murray's Materia Medica*, 1816.)—“Quicksilver, when

trituated with any substance that aids the division of its globules, and extends their surface, appears to be susceptible of oxidation from the action of atmospheric air; and the gray oxide formed by this operation is the basis of the common mercurial pill," &c.

PIL. HYDRARG. "The trituration of the quicksilver in this preparation was formerly supposed to reduce it merely to a state of extreme mechanical division. But there is every reason to believe, that an oxidation of the metal is effected, and that the medicinal efficacy of the preparation depends on this oxide. Quicksilver, in its metallic state, being inert with regard to the living system, the activity of the preparation itself is a presumption of this; but it is further known that by agitation with atmospheric air quicksilver affords a portion of gray powder, soluble in muriatic acid, and which, therefore, must be an oxide, metallic quicksilver being insoluble in that acid."

Mr. Murray having informed us that mercury is also in a state of oxide in the unguentum hydrargyri, proceeds,

"There are even additional grounds for admitting this conclusion, with regard to mercurial ointment. Unctuous matter appears in general to promote the oxidation of metals by the action of the air, as is exemplified in the green crust which copper speedily acquires when coated thinly with grease."

"The improvement of the ointment from keeping affords a similar presumptive proof.

"Unctuous matter, more especially that of an animal origin, becomes rancid from the action of air, and this rancidity appears to be connected with the formation of an acid produced from fat—the sebæic. This change may take place, to a certain extent, during the trituration, and still more when the ointment is kept, and may promote the oxidation of the mercury, while any acid that is formed may combine with the oxide. According to this view, mercurial ointment will consist of unctuous matter, in which is diffused oxide and

sebate of mercury, with a portion generally of metallic mercury, its activity, of course, depending on the former."

This explanation of the oxidation of mercury by grease is not very conclusive, since we know, that by means of saccharine substances, which are unfavorable to oxidation, the metal is reduced to the same condition in which it exists in the ointment. If unctuous substances possess the general *oxidizing* property alluded to by Mr. Murray, it is difficult to account for their successful application to the protection of machinery and metallic implements from rust.

(*Duncan*, 1815.)—"Quicksilver has a strong affinity for oxygen, and absorbs it slowly from the atmosphere." \* \*

"The black oxide is the mildest, but, at the same time, the most efficacious of the preparations of mercury. Combined with magnesia or chalk, it is not in general use; but in the form of the common mercurial pill and ointment, it is more employed than any other preparation of the same metal, except calomel."

This statement is contradicted by Phillips in the *Pharmacopœia* of 1824.

HYD. CUM CRETA. (*Phillips' Pharmacopœia*, of 1824.)

"I have only slightly examined this preparation, and I am uncertain whether it consists merely of chalk and mercury, in a state of minute division, or whether it is a sub-oxide of mercury formed by absorbing oxygen during the trituration."

"The mercury is totally insoluble in acetic acid, and, therefore, is not the black or protoxide; but when the chalk has been separated by acetic acid, the mercury does not form one fluid mass, like metallic mercury, but exists in the state of separate and minute globules."

PIL. HYDRARG. "It has been asserted, that the mercurial pill and ointment both contain the black or protoxide of mercury. It is, however, possible, as I have already hinted, when treating of hydrarg. cum cretâ, that a sub-oxide of mercury may exist, and form the base of these preparations."

Rennie, in the year 1829, differs from Phillips.

HYD. CUM CRETA. (*Rennie's Supplement*, 1829.)—

"During the trituration a small quantity is converted into the protoxide, and the remainder is mixed with the chalk in a state of very minute division."

Dr. Duncan, in 1830, differs from both, and gives, as a *possibility*, a statement which he had, in the year 1816, asserted as a fact:

PIL. HYDRARG. (*Dr. Duncan's Dispensatory*, 1830.)—"In this preparation the mercury is minutely divided, and possibly converted into the black oxide."

Brande in 1833, gives rather a different version of the case:

(*Brande's Manual of Pharmacy*, 1833.)—"By triturating mercury with chalk, a very small portion becomes converted into protoxide—the remainder is very minutely divided; and thus, perhaps, acquires some activity as a mercurial when taken into the stomach."

The same professor, in 1836, renders the subject a little more complex.

(*Brande's Manual of Chemistry*, 1836.)—"Some have regarded these preparations as merely containing finely divided mercury, and deny the possibility of oxidizing the metal, when pure, by mere agitation in the contact of atmospheric air, or trituration with viscid and oleaginous substances; it is certain that perfectly pure mercury, if at all thus acted on, is converted into an oxide extremely slowly, whilst mercury, containing a little lead or bismuth, is speedily converted into a black powder.

"If heated or exposed to the sun's rays, the protoxide is converted into peroxide and metallic mercury."

(*Dr. Ure's Chemical Dictionary*, 1835.)—"By triturating mercury with unctuous or viscid matters, it is changed partly into protoxide, and partly into very minute globules. By exposing mercurial ointment to a moderate heat, the globules fall down, while a proportion of the oxide remains combined with the grease."

In the year 1837, Phillips revives the old theory with respect to pil. hydrarg. and unguentum hydrarg., and starts a

new one in favour of hydrarg. cum cretâ. PIL. HYDRARGYRI. (*Phillips's Pharmacopœia*, 1837.)—"The mercury in this preparation is probably in a state of minute division only."

UNGUENTUM HYDRARGYRI. During the trituration with the fatty matter, the mercury is probably reduced to the same state as that in which it exists in the pilula hydrargyri."

HYD. CUM CRETA.—"I have found that a small portion of the mercury is, by the long trituration required, converted into peroxide; and this being the case, the effects derived from the use of this medicine are readily accounted for."

Mr. Phillips does not inform us how he accounts for the efficacy of blue pill and mercurial ointment. Dr. Collier remarks—

PIL. HYDRARGYRI. (*Dr. Collier's Pharmacopœia*, 1837.)—"I see no good reason for doubting that the mercury in this pill, as in the hydrargyrum cum cretâ and unguentum hydrargyri, is partially oxidized. I have known considerable quantities of metallic mercury—a pound or more—remain for many hours in the alimentary canal, without any other effect than what was purely mechanical.

"If any faith is to be placed on analyses, the exact proportion of oxidized and minutely divided mercury was stated by Professor Brande twenty years ago, although the College authority tells us that blue pill is probably nothing but metallic mercury minutely divided."

To complete the explanation, Dr. Collier observes, with reference to hydrarg. cum cretâ, that

"The name (to be consistent) ought to have been hydrargyri protoxydum cum cretâ."

Adding in a note, "It is scarcely possible to render the globules invisible by any trituration, however diligent."

UNGUENTUM OXIDI HYDRARG. CINEREI. (*Dr. A. T. Thomson's Dispensatory*, 1837.)—"As the whole of the mercury in this ointment is oxidized, it might, *à priori*, be supposed that it would answer all the purposes of the mercurial ointment; but it cannot be so easily introduced by fric-

tion, the oxide remaining on the surface of the cuticle, after the unctuous matter is absorbed. Dr. Paris justly remarks, that this is owing to its being a mechanical mixture, instead of a chemical combination; an opinion, however, which is rendered doubtful, by the experiments made to prove the non-oxidation of the mercury in the preparation of the mercurial ointment."

Dr. Thomson mentions that,

"M. Roux triturated mercury and maltha, a species of pitch, in a vacuum, and produced the extinction of the metal as well as if the operation had been performed in the air. Thence he concludes that the metal is not oxidized, but merely mechanically divided in the ointment. There are still, however, some difficulties in deciding this point. Whatever tends to favor oxidation, as, for instance, a slight degree of rancidity in the lard or oil of eggs, shortens the time, and lessens the labor required for the preparation of the ointment."

Dr. Pereira qualifies his statement as follows:—

HYDRARG. CUM CRETA. (*Dr. Pereira's Materia Medica*, 1839.)—"It consists of mercury and chalk, with perhaps a little protoxide of mercury."

The following is Professor Mitscherlich's explanation:—

(*Lehrbuch der Chemie*. Berlin, 1840.)—"When quicksilver is triturated with fat and other substances, in contact with air, there forms ultimately a black powder, which consists of metallic particles only. This can be readily ascertained by muriatic acid; because protoxide of mercury affords with muriatic acid, calomel, which is easily recognized by sublimation.

"It can be easily shown that in the common mercurial ointment (ung. hydrarg.), only finely divided quicksilver is contained, by removing the fat with ether, or by saponifying it, and then removing the soap with alcohol; the residuum, treated with a little muriatic acid and sublimed, affords only metallic quicksilver.

"If an ointment be prepared, on the other hand, quite in the same way, only using the protoxide instead of quicksilver, then the residuum, treated with muriatic acid, affords calomel."

From this chronological series of contradictory statements, it would appear that our knowledge of the subject goes very little further than this—that mercury, by oxidation, or by division, acquires the power of absorption by the system, a fact noted by Quincy in the year 1753.

The theory of metallic division, which was discarded in the year 1815, is now revived, and is ably supported; but, notwithstanding the numerous investigations which have been made in order to establish the truth, we cannot consider the question entirely settled, while some of our first authorities give us their opinions as probabilities. In a scientific point of view, the subject is interesting; and it is rendered intricate by the manner in which this metal passes from one state of oxidation to another, by exposure to light, heat, and other agencies, and the fallacies which may hence arise during our manipulations.

The cinereous or protoxide of mercury spontaneously undergoes a partial decomposition, resolving itself into a mixture of protoxide, binoxide, and metallic mercury. Globules may occasionally be observed in a bottle containing this preparation, after it has been kept for some time exposed to light, and they have also been detected in black wash. The binoxide is less liable to decomposition, but it appears that the affinity between mercury and oxygen in a low state of oxidation is very slight. Some of the phenomena which are observable in experiments on this substance, would lead us to suspect the existence of a compound containing a smaller proportion of oxygen than the protoxide, probably a hydrated suboxide, but further investigation is required in order to substantiate this theory.

But this consideration which more particularly concerns the Pharmaceutical Chemist, is the amount of importance attached to oxidation in giving medicinal activity to mercury, and the practical application of the knowledge we possess to the manipulations of that metal.

In mixing hydrarg. cum cretâ with extractum rhei, globules of mercury are frequently seen in the mortar. This is inva-

riably the case when the extract is of that hard and tenacious consistence in which it will retain its form when made into pills. If it be only the oxide which exerts an influence on the system, this separation of the pure metal is unimportant, excepting inasmuch as it proves that the preparation is imperfect; and if a portion of the mercury be oxidized by trituration with the chalk, we may infer that the whole might be so oxidized by continuing the trituration, since all the metal is exposed to the same treatment. But we know by experience that the process may be continued for weeks or even months without reducing the preparation into a state in which metallic globules cannot be separated from it; therefore, on the supposition that the oxide alone possesses any virtue, a mixture of that substance with chalk would make a more efficacious compound, and black wash, as an internal remedy, might be substituted for a preparation which, by the hypothesis, must be defective.

But we know that in the case of the unguentum hydrargyri this substitution of the oxide for the metal is quite inadmissible, as the ointment made with the oxide leaves the mercury on the surface of the skin, while the other ointment is absorbed. It may be the case that a portion of the mercury exudes in globules, and escapes unobserved during its application, but the facility with which ptyalism is produced by mercurial frictions, is a sufficient proof that a considerable portion of the metal enters the system. Although we cannot have ocular demonstration of this assimilation of mercury when taken inwardly, we may infer that the absorption of the metal may take place when applied to the coats of the stomach and other tissues in a finely divided state. It is not unlikely that, when thus divided, it may be capable of oxidation, during its passage through the alimentary canal, and in this state combine with the acids which it may meet with, forming compounds more or less active, and thus producing as much medicinal effect as it would have done if administered in the form of an oxide.

A single dose of blue pill will sometimes act as a purgative,

and a few small doses taken at intervals will effectually salivate; if therefore we attribute its efficacy to the minute portion of mercury, which may "*probably*" become oxidized during the trituration of the mass, we need go only a step further to become the disciples of Hanneman.

The manner in which mercury combines with other substances, in the form of amalgams, is not a little mysterious, although it may probably throw some light on this subject.

An amalgam of mercury and potassium placed on a piece of muriate of ammonia, and subjected to the action of voltaic electricity, increases in volume and weight, acquiring more ductility, and evidently entering into chemical union with the salt.

The linimentum hydrargyri is said to salivate more freely than the unguentum—the camphor and ammonia appearing to promote its absorption.

Tin, lead, and other metals, in conjunction with mercury, are vapourised at the boiling point of that metal.

In manufactories, where mercury is vapourized to any considerable extent, the workmen are often salivated, and sometimes die in consequence of this insensible absorption of the metal thus minutely divided.

The conversion of the metals into glass is another instance of metamorphosis, which can only be explained by a bare statement of the fact. A silver coin held in the hand of a person whose system is saturated with mercury, has been observed to become tarnished by the amalgam formed with the mercury exuding through the pores of the skin.

Platina can also be reduced to a black powder, which consists of the pure metal, and is nevertheless so fine that it may be mixed with a vehicle and used as a pigment. Other metals may also be powdered.

Arsenic exists in union with hydrogen as a gas, and in that state may be inhaled and assimilated like atmospheric air.

From these facts, it is evident that the properties of a metal, in substance, afford no criterion of its effects or diffusi-

bility, when mechanically placed under circumstances favorable to chemical action and combination.

These considerations, originating in the endeavor to account for the separation of mercury from chalk by trituration with tenacious extracts, induced me to try a variety of experiments, in order to satisfy myself as to the actual state of the metal in that preparation, and the laws which regulate its reduction to and continuance in a state of minute division.

A portion of hydrarg. cum cretâ was tied in a piece of leather, and subjected to the force of a powerful press; on removing it, a considerable quantity of the metal was found to have been separated in the form of globules.

Another portion was boiled in excess of dilute acetic acid, so as to ensure the complete saturation of the chalk. The residuum was washed with water, and appeared like a black powder moistened into the form of a paste. Some of it, in a glass with a little water, was placed by the side of another glass containing cinereous oxide in the same fluid. The precipitates appeared similar, but on adding muriatic acid to both, the oxide was converted into calomel, the other remained without any visible alteration. The remainder of the black paste was dried upon a filter; as the evaporation proceeded the globules appeared, and when it was perfectly dry, almost the whole of it assumed the metallic state, as may be seen by the result, which is on the table. The same experiment was tried without using heat, the precipitate being dried in the dark. The result is also on the table, consisting chiefly of metallic mercury, with a very small quantity of black powder. Some of the precipitate in the latter experiment was boiled with dilute acetic acid. Before the ebullition commenced, the precipitate rose to the surface, floating in the form of minute spherical particles. These alternately rose and fell in the liquid, like pith balls electrified under a tumbler. When cool, their former specific gravity returned, and they fell down like a heavy precipitate. The acetic acid in which the above had been boiled was tested, and gave no indication of the presence of a mercurial salt.

Two drachms of peroxide of mercury were triturated with one drachm of the metal. For a considerable time very little effect was produced, excepting that the powder assumed a black color, the metal remaining in a fluid state : on adding a little water, the mercury gradually disappeared, and the mixture ultimately became a reddish black powder. This was placed on a filter and dried in the dark. When dry a globule of mercury was separated ; the remaining powder was of a greenish red color. This shows that the peroxide of mercury, when moist, has the power of dividing the metal without imparting to it the oxygen required for converting it into a protoxide.

Hyd. cum cretâ, when used as plate powder, gives silver a peculiar black tinge and brilliant polish, dependent on the amalgam formed by the two metals. A mixture of the cinereous oxide of mercury with chalk has a very different effect, which may be easily observed by cleaning a silver spoon with each of the two powders and comparing them together. It is clear that mercury, when in the state of an oxide, does not possess the same power of uniting with silver as an amalgam.

Extractum rhei, which was rather hard and tenacious, was triturated with hydrarg. cum cretâ : globules were separated as usual. A few drops of water were added, and by continuing the process, the mercury was again absorbed ; the mass was then too soft for dividing into pills. The division of mercury by extract is probably analogous to the division of oil and wax by water in cold cream. If stale cold cream be stirred in a mortar, a large proportion of the water separates, but the union is restored by persevering in the trituration.

M. Desmarest, in an article in the *Journal de Pharmacie* on the division of mercury (1829,) informs us, that "fat and viscous substances have not the property of invariably maintaining the division of mercury : but they lose it when their consistence is increased to that point at which they may be considered more like solids than liquids, because then the envelope which they form round the globules, having lost its flexibility, breaks, and allows them to re-unite. Having

solidified mercurial ointment by exposing it to a freezing temperature, or by saponifying it, I have seen the mercury separate in large globules by trituration, which also occurs on drying the mercury and gum (*mercure gommeux*) of Plenck, and the pills of Belloste, which I have verified several times."

The effect which consistence has in favoring or obstructing the division of mercury, throws some light on the increased facility which grease possesses when rancid, of effecting the disappearance of the globules, which circumstance was formerly supposed to depend upon the promotion of oxidation. In becoming rancid, the stearine and elaine in ointments become converted into margaric and oleic acids, and a substance is also generated resembling a volatile oil, in its viscous property. M. Desmarest has shown, in the paper above mentioned, that the peculiar viscosity which belongs to essential oils, is favorable to the extinction of the mercurial globules, and the consistence of rancid ointment being altered by the decomposition, we may infer that the difference of its effect on the metal is more mechanical than chemical.

If the extinction were occasioned in all cases by chemical action, we might expect to find that sugar, which is unfavorable to oxidation, would be incapable of effecting the change. To ascertain the limitations of the divisibility of mercury, by means of saccharine substances, the following experiments were tried. Two drachms of mercury were rubbed with simple syrup of the ordinary consistence, for above half an hour; no change had taken place in the metal. The globules ran together as freely as ever, and appeared more obstinately metallic than before. Powdered sugar was added in small quantities, and the trituration was continued. When the syrup assumed a plastic viscous consistence, the mercury appeared unable to resist its influence, and gradually became divided without difficulty. In less than half an hour the globules were quite extinct, or at least they were invisible with the naked eye. Water being added, and the sugar dissolved and separated, the residuum was a black precipitate, similar to that which results from treating hyd. cum cretâ

with acetic acid; and when dry, the mercury appeared as usual on the filter. The same experiment was tried, substituting *mel despumatum* for syrup. The honey, in the first instance, divided the mercury more readily than the syrup, but the completion of the division was ultimately expedited by the addition of enough sugar to give it the right consistence.

These experiments confirm the supposition that chemical action is not necessarily concerned in the division of mercury by trituration, but that the effect depends upon the mechanical texture of the substance employed.

An additional proof of this fact is found in the extreme difficulty of effecting the extinction of mercury with a dry substance like chalk, as compared with the effect of other more appropriate substances. To obviate this difficulty in the hydrarg. cum magnesiâ of the Edinburgh Pharmacopœia, the mercury is directed to be triturated with manna, moistened with a little water; after the union is complete, the magnesia is added, the manna separated by washing, and the precipitate dried.

The following experiment with blue pill is as conclusive as those already mentioned: Blue pill was boiled in water, and the sediment having subsided was washed several times to separate the conserve. The result was placed on the filter, and allowed to dry spontaneously. As long as it retained a soft consistence very little appearance of mercury was observable—it was like a black paste. But in the course of a few days, it became quite hard and brittle. When broken between the fingers the greater portion of it fell down in the form of pure mercury. A simple fracture displayed a surface of extremely minute globules in a spongy substance. It was evident that the whole of the conserve had not been separated, but the experiment was sufficiently accurate for the purpose.

The late Mr. Earle recommended a pill composed of one drachm of mercury with five drachms of extract of hemlock, which, by trituration for a quarter of an hour, become com-

pletely united. Mr. Earle frequently ordered this compound, and stated, that in obstinate cases, in which the usual mercurial remedies failed to affect the system, three or four grains of the "*pilula conii cum hydrargyro*" had the desired effect in a short time. He also observed, that in almost all cases in which *hyd. cum cretâ* or *pil. hydrarg.* were indicated as an alterative, the addition of the conium was rather an advantage than otherwise, as its sedative properties facilitated the absorption of the mercury by preventing its action on the bowels, while the narcotic effect was not perceptibly objectionable.

Following up this idea, it occurred to me that other extracts might be applicable for the reduction of mercury in the same manner, which the subjoined experiments prove to be the case.

Extract of *hyoscyamus* was found to unite with metallic mercury, by trituration, in about half an hour; *extractum sarsæ.* in twenty minutes; *extractum taraxaci* in ten minutes, and *extractum rhei* in about twenty minutes. In mixing these preparations, a very perceptible change takes place in the extract, at the time the union commences. *Ext. hyosciami*, for instance, loses its friable and spongy texture, becomes adhesive and plastic, making a crackling noise as it is stirred in the mortar. The union with *ext. taraxaci* appears to be more complete than with any of the others; for it was found impossible entirely to separate the mercury afterwards by washing. Filtering paper, the texture of which was such as to allow the passage of the extract, would not retain the mercury, which came through it in so minute a division that it scarcely had the appearance of a precipitate, but seemed to be completely suspended in the liquor.

This property of dividing mercury cannot depend upon any acid which the extracts contain, since vegetable acids have little or no chemical action on the metal, and *extractum taraxaci*, supersaturated with caustic potash, was found to divide it as easily as without the addition of the alkali.

The elements of an extract being united, namely, albumen,

sugar, essential oil, gum, starch, *facula*, and resin, it was found that the compound had the power of dividing mercury with great facility ; and the absence of coloring matter afforded the opportunity of observing its composition. A portion of it, rubbed on a plate of glass, showed no globules ; the color became darker, and the friction appeared to confirm the extinction of the metal. But as it dried, very minute globules started up, as if suddenly liberated from confinement, in the same way as the metal makes its appearance on the filter, in the experiments with *hydrarg. cum cretâ*, &c. Resin, moistened with essential oil, was found to divide the metal with greater facility than any of the substances or compounds above mentioned. In two minutes the globules were invisible in the mortar to the naked eye. The other elements of an extract, unassisted by resin and essential oil, were found to have much less power of dividing mercury, above half an hour being required for the extinction of globules. From what has been stated, we may conclude that

The preparations under consideration are dependent for their efficacy on the impalpably minute division of the mercury, and if any oxide exist in them, the circumstance is accidental, and the quantity so small as to be unimportant.

Mercury, when alloyed with other metals, is speedily reduced to a black powder, as stated by Professor Brande, but it is not yet proved that this powder consists entirely of oxide.

Chalk has a very limited power of dividing the metal, or retaining it in a state of division. The vehicles for *hydrarg. cum cretâ* should, therefore, be such as are not likely to effect the separation ; and soft friable extracts possess the requisite texture.

Extracts in general have great facility in dividing the particles of mercury, and the direct union of the metal with some of these preparations might be attended with advantage.

Extracts which are of a viscous, tenacious texture effect the division more speedily than those which are soft and friable ;

the former, however, when too hard, liberate the mercury instead of promoting its division.

The addition of substances which act chemically upon mercury is unnecessary in effecting its extinction, as the circumstance requiring particular attention is the degree of viscosity possessed by the menstruum, and resinous substances are particularly applicable.

An insoluble powder divides the metal with increased facility when mixed with water into the form of a stiff paste.

*Lond. Pharm. Trans.*

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#### ART. XXXVI.—ON THE DAPHNE TRIBE OF PLANTS.

By MR. SQUIRE.

HAVING ascertained that a considerable quantity of the root supplied to the trade as Mezereon, is, in fact, the root of the *Daphne Laureola*, I propose to offer some remarks on this tribe of plants, with the result of a few experiments which I have made, for the purpose of ascertaining the comparative efficacy of the above species.

Dr. A. T. Thomson states, in a foot-note in his Dispensatory, that in France the *Daphne Gnidium* and in Germany the *Daphne Laureola* are indiscriminately used for the *Daphne Mezereum*. In Dr. Pereira's *Materia Medica* it is stated, that *Tragus* (1532) is the earliest author who mentions the *Daphne Mezereum*, and says, that the Mezereon of Avicenna and of other Arabian authors, is declared by C. Bauhin to be the *Chamelæa Tricocca* (now called *Cneorum tricoccon*), a plant of the order *Euphorbiaciæ*; but it is probably identical with the *χαμελαία* of Dioscorides, which is declared by Sibthorp to be the *Daphne Oleoides*. It is unnecessary to give a botanical description of these plants, as they are described in every work on medical botany.

In the *Daphne* tribe there are many varieties. The following are on the table, all of which appear to possess, in a different degree, the irritating property peculiar to the class:—

				Introduced into England.
<i>Daphne Neapolitana</i>	-	<i>Native of Naples</i>	-	1822
" <i>Cneorum</i> (Garland flower)	-	<i>Austria</i>	-	1752
" <i>Indica</i>	-	<i>China</i>	-	1800
" <i>Indica rubra</i>	-		-	
" <i>Oleifolia</i> (silky)	-	<i>Crete</i>	-	1820
" <i>Gnidium</i>	-	<i>Spain</i>	-	1597
" <i>Axillaris</i>	-		-	
" <i>Pontica</i>	-	<i>Pontus</i>	-	1759
" <i>Pontica rubra</i>	-	<i>hybrid</i>	-	1827
" <i>Collina</i> (hill)	-	<i>Italy</i>	-	1752
" <i>Tarton-raira</i>	-	<i>France</i>	-	1640
" <i>Dauphinii</i>	-		-	
" <i>Mezereum</i>	-	<i>Woods, England</i>	-	
" <i>Laureola</i>	-	"	-	

In the London Pharmacopœia only the bark of the root of the *Daphne Mezereum* is ordered. In the French Codex the powder of the bark of the *Daphne Gnidium* only; and a caution is given in the arrangements for powdering a substance so dangerous to the operator. I have myself suffered severely when powdering either the *Daphne Mezereum* or *Laureola*, from the small particles rising and irritating the nostrils.

In the remarks on Decoctum Sarsæ. Co., in the London Pharmacopœia, it is asserted, that "*Mezereon* is the only active substance here added to the sarsaparilla: it contains a neutral vegetable matter, called *Daphnine*." The Edinburgh and Dublin Pharmacopœias order a decoction of *Mezereon*, made with two drachms to three pounds of water, boiled to two-thirds, to which half an ounce of liquorice-root is added.

Several foreign Pharmacopœias have formulæ similar to this, but the proportion of *Mezereon* is greater. Formulæ for gargles, ointments, tinctures, and paper saturated with

the acrid resinous matter, are to be found described in other works.

According to Dr. A. T. Thomson, these plants are violently emetic and purgative, useful in chronic rheumatism, scrofulous swellings, lepra, and other cutaneous diseases. Dr. A. Russell recommended Mezereum for venereal nodes. Dr. Home found it a very powerful deobstruent in all venereal tumours of a scirrhus kind, when mercury had failed. Mr. Pearson denies its efficacy in curing venereal disease in any stage. Dr. Cullen employed it in cutaneous diseases. It has been used with success in paralysis of the throat. In France it is used to produce vesication, the bark being macerated in hot vinegar, and applied with a compress and bandage. Linnæus states, that six berries of the *Daphne Mezereum* will kill a wolf; and he saw a child, who had taken twelve of them for an ague, die by excessive vomiting and hæmoptysis. Lewis, in his *Pharmacopœia*, states, that the leaves, taken in small doses, produce vomiting and purging, and cannot be ventured upon with safety, unless their virulence be previously abated by long boiling, and even then they are precarious remedies. He asserts, that the flowers and the pulp of the seeds are harmless, but that the seeds themselves are as acrid and virulently purgative as the leaves.

The *Daphne Mezereum* seldom rises higher than four feet; it is chiefly cultivated in our gardens, but is said to grow wild in the central counties. The *Daphne Laureola* is generally from two to three feet high, and grows wild in the woods over the whole of Europe as far south as Sicily.

The inner bark of the *Daphne Mezereum* is highly acrid, creating in the mouth and fauces a burning sensation, and, if swallowed, it affects the whole lining of the œsophagus and stomach in the same manner. With some individuals this sensation continues only a few hours, while others feel it as long as two days. In the case of *Daphne Laureola*, I remarked that this effect is followed by a profuse perspiration of the face, head, and neck, and that as soon as this was fairly

produced, the heat in the œsophagus and stomach began to subside.

I could not obtain any blistering effect from the resin extracted by alcohol, and I imagine that moisture is necessary, in order to produce an irritating effect. I made several experiments to ascertain the difference in effect between *Daphne Mezereum* and *Daphne Laureola*. When recently dried, they both possess a peculiar odor, which is stronger in the latter than in the former; but the *Mezereum* has decidedly the advantage, both in the degree and duration of the irritation produced on the mucous linings of the throat. The inner bark (of the *Daphne Laureola* in particular) is very tough, being broken with difficulty by manual force.

The bark of the root is the most efficacious part of this class of plants; next in order the bark of the stems, the leaves, the woody parts of the stems and roots, and, lastly, the flowers.

13½ lb. of fresh <i>Mezereum</i> root	{	3½ lb. of wood,
produced in drying - -		3½ lb. of bark, dry,
		equivalent to 8½ lb. of fresh bark.

3 lb. of stems of *Mezereum* produced ½ lb. of dried bark.

7 lb. of *Daphne Laureola* root yielded 4 lb. 5 oz. of fresh bark, or 1 lb. 1½ oz. of dry bark.

11 lb. of the stems yielded 1½ lb. fresh bark, which, when dried, weighed ¾ lb.\*

The pungent odor given off, by boiling *Mezereum* root in water over a lamp, is so powerful, that after holding my head over it for a short time, great irritation was produced, and it was difficult to carry on respiration. I observed the same effects from boiling the *Daphne Laureola*, but in a less powerful degree.

The active principle of the *Mezereum* being volatile in aqueous vapor, it is likely that maceration with heat, in close vessels, would be a more efficacious mode of preparing it than by decoction.

\* The bark of this plant is, in Germany, collected in the spring.

In order to repeat Vauquelin's experiment of distilling the alcohol from the tincture of Mezereon, I digested half an ounce of bruised bark of the root in ten ounces of alcohol, for twelve hours, at about  $150^{\circ}$ , and then distilled off one-half of the alcohol. In this process none of the pungency of the root comes over, and consequently the tincture, which remains in the retort, is concentrated in proportion to the quantity of alcohol removed from it. By this means we may obtain a very effective preparation, which may be given internally, or mixed with lard, to form a stimulating ointment. When an ointment is made by boiling the root in lard, it very soon spoils by keeping.

The above ten ounces of tincture yielded a drachm of dry resin; but the *Daphne Laureola*, treated in the same manner, yielded only forty-five grains.

It is my intention to make further experiments on this subject, with a view to investigate the active principle on which the effects of this class of plants depend, for it is clear the efficacy does not reside in the so-called vegetable alkaloid Daphnine. Those who are interested in it may find some information in a paper, by M. Vauquelin, in the "Annals of Philosophy," new series, 8th vol., page 305, where several experiments are described, showing the active principle to be analogous to conia in its nature. *Ibid.*

ART. XXXVII.—ON THE GELATINIZATION OF TINCTURE  
OF KINO. By MR. REDWOOD.

THE change which takes place in tincture of kino from the fluid to the gelatinous form, is a frequent source of inconvenience to the Pharmaceutical Chemist. This change being often effected when the tincture has been prepared only a few months, and the demand for the preparation being very limited, it is found difficult to preserve a supply, at all times fit for use.

No satisfactory explanation appears to have been hitherto given, either of the nature or the cause of this change, although it is alluded to in most Pharmaceutical works. By some authors it is said to be peculiar to a particular species of kino; and where accounted for at all, it has generally been ascribed to the presence of pectin or pectic acid.

Dr. A. T. Thomson describes four different kinds of kino, under the names of African, Botany Bay, Jamaica, and East Indian or Amboyna kino. To the second of these, the Botany Bay kino, which is the produce of the *Eucalyptus resinifera* or *iron-bark tree*, he ascribes the property of forming a tincture which gelatinizes on keeping.

Dr. Pereira also in alluding to this property in tincture of kino, says, "where this occurred, probably the Botany Bay kino (inspissated juice of the *Eucalyptus resinifera*) had been employed." Pereira further states with regard to this species of kino, "that when digested in cold water, it swells, becomes soft and gelatinous (like red currant-jelly,) and yields a red liquid which reddens litmus, and yields precipitates with lime-water, gelatine, acetate of lead, sesqui-chloride of iron, and, if caustic potash or ammonia be previously added, with the chloride of calcium. Alcohol and emetic tartar occasion no precipitate. Digested in rectified spirit, Botany Bay kino becomes gelatinous as with water, and yields a similar red so-

lution, from which water precipitates nothing, but which reddens litmus, and deposits a copious precipitate when potash, ammonia, or lime-water is dropped in. From these and other experiments (says Pereira,) I infer that Botany Bay kino consists principally of pectin and tannic acid."

It is well known, that alcohol added to a solution of pectin, causes it to assume the form of a consistent jelly; but this result sometimes does not ensue until after an interval of several days, which in some degree seems to correspond with the phenomena observed in tincture of kino. On the presumption, therefore, that the gelatinization of this tincture depends on the presence of pectin, rectified spirit has been used in its preparation instead of proof spirit, with the view of obviating that result, pectin being insoluble in rectified spirit. This substitution, however, has not been found to effect the intended object, as the tincture prepared with rectified spirit is subject to the same change as that made with proof spirit.

There is one fact connected with the change effected in tincture of kino, which, although incidentally noticed by Pereira, appears not to have been sufficiently taken into account in explaining the cause of the gelatinization. It has been observed that the tincture, as it assumes the form of jelly, loses in a great measure its astringent property. On first directing my attention to this subject, I thought it probable this might arise from the insolubility of the gelatinous mass; and finding allusion made, in a paper by Berzelius, in the *Annales de Chimie et de Physique*, for 1828, to an insoluble combination of pectic acid and tannin, which he and others had met with in the extract of nutgalls, and more especially in the extract of oak bark, I concluded that the gelatinous tincture of kino would prove to be a compound of a similar nature. Both pectin and tannic acid are susceptible of such a variety of changes, under the influence of different agents, that some modification of their characters might be anticipated in such a compound. Thus pectin is converted into pectic acid by the action of alkalies or strong acids, and

again into metapeptic acid by the prolonged action of an alkali. Tannic acid, also, when in solution, speedily undergoes a change, even from the action of the atmospheric air. We might, therefore, easily account for the conversion of pectin into pectic acid, supposing the former to be present in the kino.

But it does not appear that Botany Bay kino is now introduced into our market. Dr. A. T. Thomson says, he has been informed "that little of it has been brought to this country since 1802." He states that the kino generally met with in the shops, is that imported from the East Indies, and is an extract formed by inspissating a decoction of the branches and twigs of the *Nauclea Gambir*, a plant belonging to the natural order *Cinchonaceæ*.

East Indian kino has been examined by Vauquelin, who gives the following as the result of his analysis: *Tannin* and *peculiar extractive matter* 75; *red gum* 24; *insoluble matter* 1. Now we have no mention here of the existence of pectin in this species of kino; and this fact, taken in connexion with that of the tincture becoming gelatinous when made with rectified spirit, would naturally tend to the conclusion, that the property under consideration must be due to some other cause than that to which it has been assigned.

The following experiments were undertaken with the view of further investigating this subject. A sample of tincture of kino was obtained, which was almost completely gelatinized, a small portion only of fluid floating on the surface. This fluid was separated by repeatedly washing the gelatinous mass with cold water. The washings slightly reddened litmus paper, and on being tested with gelatine afforded a precipitate indicating the presence of tannic acid. The quantity of tannin detected in this way was very small. The jelly, after being purified by washing, was perfectly insipid, and insoluble in cold water, in alcohol, and in ether. This substance was dried and pulverized, and then treated with boiling water, which took up a very small proportion, and formed

a slightly-colored solution, neutral to test paper, but yielding precipitates characteristic of tannic acid, with gelatine, sulphate of copper, and nitrate of silver. A black precipitate was formed on the addition of protosulphate of iron.

The insoluble residue, left after treating the gelatinous substance with boiling water, was now boiled in solution of ammonia, in which, as well as in solution of caustic potash, it was found to be perfectly soluble, forming a deep brown solution. The solution with ammonia being boiled so as to expel the excess of ammonia, and chloride of calcium being added, afforded a copious precipitate of a reddish-brown color. This precipitate was washed with diluted muriatic acid, and collected on a filter. It was insoluble in water with boiling, and equally so with the addition of sugar. Alcohol dissolved it entirely, and formed a solution which showed no disposition to gelatinize. It is very evident, therefore, that the precipitate thus obtained was not pectic acid, and that neither pectin nor pectic acid was present in the gelatinous mass.

The solutions formed with ammonia and with potassa, throw down precipitates on the addition of nitric, sulphuric, or muriatic acid; they afford a deep, black precipitate with sulphate of iron, but no precipitate with gelatine. *The ammoniacal solution affords a deep red precipitate with nitrate of silver.*

These reactions correspond so exactly with those of ulmic acid, that I am disposed to consider the gelatinous matter formed in tincture of kino, to be identical with, or very analogous to that substance.

The class of bodies to which the terms ulmine, ulmic acid, and humus, are applied, have not been much studied until very lately, when more attention has been directed to them in consequence of their supposed influence upon the fertility of soils. These bodies, as generally met with, are produced either by the decomposition of vegetable matter in the soil, or as the result of disease in plants. They may also be produced by the action of dilute acids and heat upon sugar, or

by exposing sawdust and hydrate of potassa, moistened with water, to a moderate heat. By this last process, ulmate of potassa is formed, which is soluble in water, and from which ulmic acid may be precipitated by either of the strong acids.

Ulmic acid, thus obtained, is similar in color to the gelatinous tincture of kino. It is insoluble in water, alcohol, and ether; but soluble in solution of caustic potash or of ammonia. The alkaline solutions, on the addition of chloride of calcium, yield a reddish-brown precipitate, which is soluble in alcohol. They yield a black precipitate with sulphate of iron, but no precipitate with gelatine. *The ammoniacal solution yields a deep red precipitate with nitrate of silver.*

I have not yet submitted the insoluble product of the gelatinous tincture to an ultimate analysis, but the result of its examination by reagents, appears to be so conclusive, as to leave but little doubt of its identity with ulmic acid. There are several points, connected with the conversion of the tannin contained in tincture of kino, into this substance, which open a wide field for further investigation, and will add to the interest which has already been felt, in what may be called the *tannin family*. The difference which exists in the properties of this body as obtained from different sources, and the changes which so readily take place in the several kinds of tannin, have frequently attracted the attention of chemists. In a paper on tannic acid by Berzelius, to which I have already alluded, he observes that "the tannin contained in kino, differs greatly from that obtained from nutgalls, cinchona bark, or catechu:" "that it has so great a tendency to form *extractive*, that its solution becomes turbid from contact with the air, and deposits a transparent red substance." The organic matter to which the term *extractive* is thus applied, appears to be but ill defined and imperfectly understood. According to Dr. Kane, it consists of that portion of a plant which has been dissolved out by means of water, and partly decomposed during the process of inspissation.

He says, "when the conversion of the real constituents of the plant into apotheme is yet incomplete, the material which dissolves equally in water and dilute alcohol, but not in absolute alcohol or in ether, is termed *extractive*."

Now, in accordance with this definition, we may consider the kino or inspissated decoction of *Nauclea Gambir*, and the gelatinous tincture of kino, to be both products in which a change has been effected, first, from pure tannin to extractive, and then, from extractive to insoluble apotheme, or ulmic acid; only that, in the latter product, this change has been more complete than in the former. Thus it will be found that the insoluble residue of the kino, left after making the tincture, corresponds precisely with the gelatinous matter afterwards formed in the tincture. The partial conversion of the tannin into extractive and insoluble apotheme in the kino, has been effected by the action of the air and moisture, expedited by heat, during its inspissation. In the absence of moisture this change is suspended, and kino, if properly preserved, will be found to contain these three constituents, *tannic acid*, *extractive* or *altered tannin*, and *insoluble apotheme*, or *ulmic acid*. In the preparation of the tincture, the tannic acid and extractive are taken up by the alcohol, and the conditions essential to the progress of the change being now again present, the transition of the tannin into ulmic acid is gradually completed, giving rise to the gelatinous tincture under consideration.

The most effectual means of preventing this change would probably be, in preparing the tincture, to extract as speedily as possible the most soluble part of the kino, without allowing the solution, thus formed, to remain long in contact with the altered and less soluble constituents. It is well known that organic matter in a state of transformation acts as a kind of ferment in promoting a similar change in those bodies with which it may be in contact; and with a substance so susceptible of change as tannic acid, the influence thus exercised would, no doubt, be very decided. In confirmation of this, it will be found that tincture of kino made by the process of

displacement is much more fluid than that prepared by maceration; the latter being generally too thick and viscid to pass through a filter, while the former is a perfectly limpid solution. It is stated in the Edinburgh Pharmacopœia that tincture of kino cannot be made by displacement; but it is only necessary to mix the kino with a proper proportion of clean white sand, to enable the spirit to percolate through it with perfect facility.

In the American Journal of Pharmacy for 1840, allusion is made to the preparation of this tincture by displacement, and equal quantities of kino and of sand are directed to be used in operating in that way. It is also stated, that tincture of kino thus made has been kept for more than twelve months without becoming gelatinous.

In addition, however, to the adoption of percolation in preparing the tincture, the further precaution should be taken, of keeping it in well filled bottles, accurately stopped, so as to preclude, as much as possible, the access of atmospheric air. This precaution I conceive to be important. If a pint of the tincture be made, it should be put into two half-pint bottles, instead of keeping it in a quart or two quart bottle for dispensing, as is frequently the case. The contact of a large body of atmospheric air must undoubtedly tend to expedite the change, and it is evident, that long before the tincture has become gelatinous, a considerable proportion of the tannic acid will have assumed a new and altered condition, from which its medicinal properties will be greatly impaired.

*Ibid.*

## MISCELLANY.

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*Purification of the Hydrated Peroxide of Iron.* By M. VICTOR LEGRIE.—Several Chemists, and among others M. Orfila, have lately discovered the presence of arsenic in the hydrated peroxide of iron, which is recommended as an antidote for that poison. However small the quantity of arsenic may be in this preparation, and however inoffensive its effects, it is nevertheless desirable that we should be able entirely to eliminate from an antidote, the poisonous substance which it is intended to combat. The following process will attain this object:

It consists in treating a clear solution of sulphate of iron with sulphuretted hydrogen in great excess. The best way is to pass a current of the gas through it for a long time. It is then to be boiled until it affords no smell of the sulphuretted hydrogen; allowed to stand for a day, then collected on a filter, converted into oxide, at the maximum of oxidation, by means of nitric acid with the aid of heat; passed through a filter, and the whole of the peroxide precipitated by ammonia. The ferruginous precipitate should be well washed and preserved for use. It is important to attend to the purity of the water used in the process, which should be either distilled water, or at least rain water well purified and filtered.

*Journal de Chimie Medicale.*

*Transformations of Cinnamic Acid.*—M. E. SIMON states, in a communication to the *Annalen der Pharmacie*, that cinnamic acid is transformed into oil of bitter almonds, by distillation with a mixture of sulphuric acid and bichromate of potass. If, on the other hand, cinnamic acid be distilled with three times its weight of slacked lime, a colorless volatile oil is obtained, much resembling benzine, partaking of the same composition, but which possesses entirely different properties, and probably also a different atomic weight. M. Simon calls it cinnamomine. Treated with fuming nitric acid, a substance is formed, which, by its taste and smell, resembles nitro-benzide, and which he calls nitro-cinnamide. A deeper investigation into these compounds would not be devoid of speculative interest.—*Berzelius's Report on the Progress of Science.*